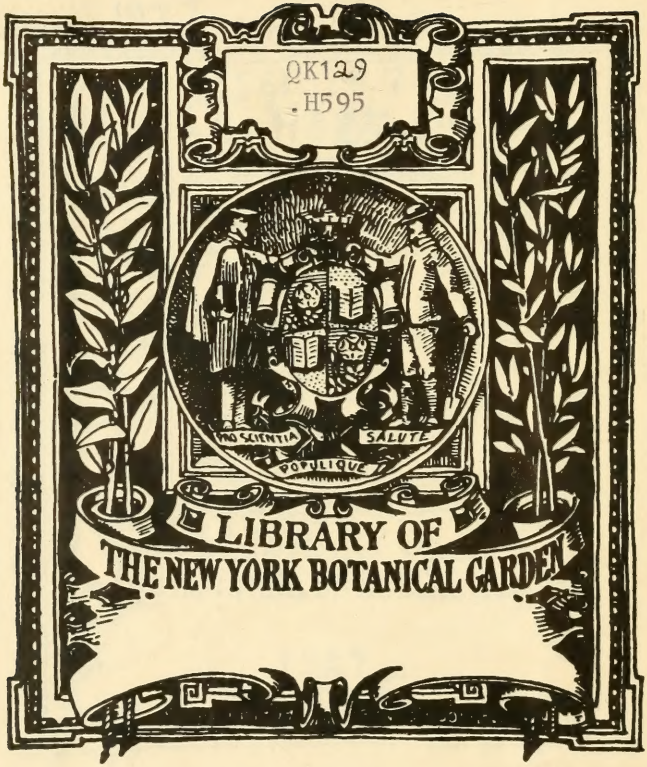

New York State Museum Handbook 2

NEW YORK STATE MUSEUM

CHARLES C. ADAMS, *Director*

FLORA OF THE ALLEGANY STATE PARK REGION

BY HOMER D. HOUSE Ph.D.

State Botanist, New York State Museum

AND

WILLIAM P. ALEXANDER

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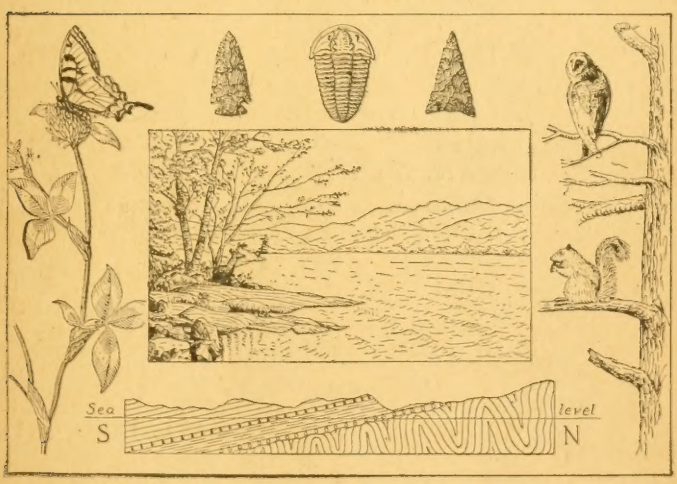

ALBANY

THE UNIVERSITY OF THE STATE OF NEW YORK

1927

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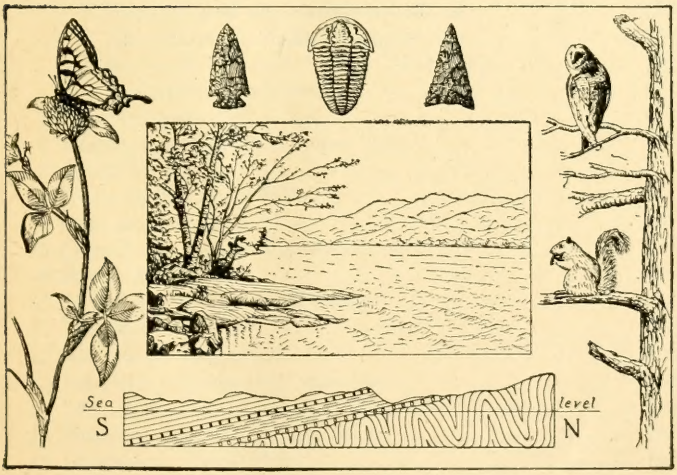

ALBANY

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(Photo by New York State Museum)

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New York State Museum

FLORA OF THE ALLEGANY STATE PARK REGION

By Homer D. House Ph.D.
State Botanist, New York State Museum
and
William P. Alexander
Buffalo Society of Natural Sciences

INTRODUCTION

The Allegany State Park is located in the southern part of Cattaraugus county, south of the great bend of the Allegheny river, and bounded on the east by the valley of the Tunungwant creek, which flows northward from Pennsylvania into the Allegheny at a point about ten miles west of Olean. The accompanying sketch map (figure 2) of western New York indicates the location of the park area (heavily shaded) and the adjacent Allegheny and Tunungwant valleys (lightly shaded), with reference to the principal political and geographical features of the region. The larger map (figure 34) indicates the location of the streams and localities mentioned in the following pages. The flora of these valleys has been included in this survey largely for the contrast it forms with the flora of the uplands of the park area proper.

The location of the park area is along the northwest rim of the great Appalachian plateau, but outside of the southern limits of the ice sheet of the glacial period. The southern limit of the glaciated region forms a great curve around the western and northern sides of the

Allegheny valley, nowhere apparently penetrating into the bottom of the valley. The surface geology of the area shows most plainly the characteristics of an unglaciated region, which is reflected to some extent upon the composition of the present vegetation. This is most marked if we consider only the vegetation of the hills and valleys of the park area proper situated south of the bend of the Allegheny river. In the Allegheny valley the accumulation of gravels, sand and clay from the

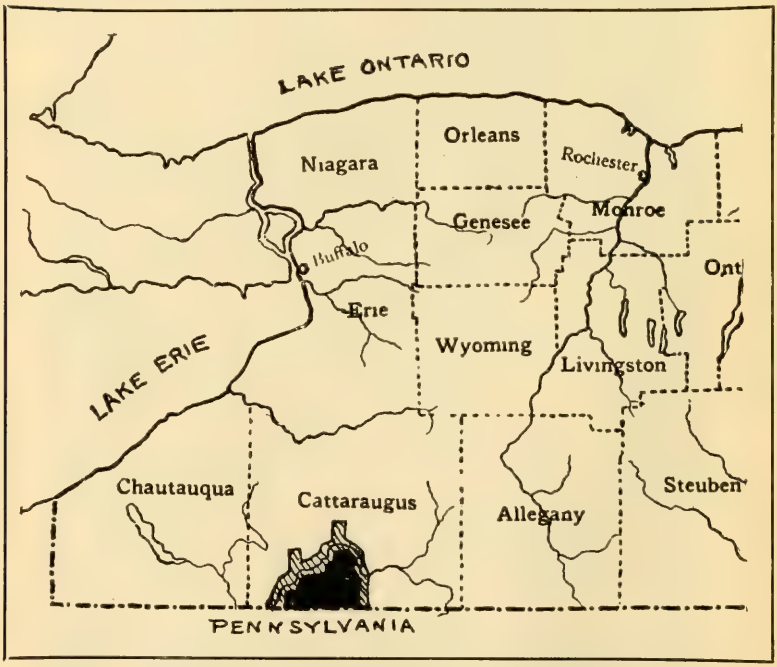


Figure 2 Sketch map showing the location of the Allegany State Park with reference to western New York

closely adjacent front of the ice during the glacial period has produced a peculiar combination of conditions which deserves a more extended ecological study.

There is no evidence that the Allegany State Park and the adjacent bottomlands of the Allegheny river and the Tunungwant creek, which are included in this survey, were originally other than a heavily forested region. White pine was the principal tree of the lower slopes and bottomlands, while a mixed forest of hemlock, maple, beech, ash, chestnut, cherry, basswood and oak, covered the upper slopes and ridges. The relative abundance of these trees naturally varied considerably on different slopes and on different types of soil.

CLIMATE

The general climatic conditions of the park area are more typically continental in type than those of the Hudson valley or Long Island, where the influence of the ocean upon climate is very evident. Mordoff (Climate of New York, Cornell Agric. Exp. Sta. Bul. 444, Oct. 1925) includes this area in the "western plateau" climatic subdivision of the State. The general climatic conditions prevailing in the region of the Allegany State Park are very similar to those of the eastern plateau region, which includes the western Catskills and the uplands of Otsego and Schoharie counties, and even bears a close similarity to the conditions of the outer rim of the Adirondack plateau.

According to Mordoff the mean temperature for the growing season of 140 to 150 days is 58 to 60 degrees Fahrenheit, the average date for the last killing frost in spring is about May 20th, and for the first killing frost of autumn about October 1st. The mean annual precipitation is 40 to 45 inches, and for the growing period only, 18 to 20 inches. The lowest recorded temperatures are less than for the other regions mentioned, doubtless due to the moderating influence of the Great Lakes on the

northerly and northwesterly winds. On the other hand, the prevailing westerly winds of the warmer months of the year are apparently not greatly influenced by the Great Lakes, which lying north and northwest of the park exert their modifying influence chiefly upon the Ontario lowlands of the State and upon the region east of Lake Ontario.

LUMBERING

Elisha Flag is said to have been the first one to lumber this region to any considerable extent. The beginning of his operations is placed at about 1842, and only the best pine was removed from the lower valleys and slopes, particularly in the Quaker run region. His sawmill was located at the present Campbell place on lower Quaker run and the position of the dam and millpond is still visible. The sawn lumber was rafted down the Allegheny river, as the Erie Railroad was not built until 1862–64. In the '80's and later the region was still being lumbered for the best pine and hemlock. Hemlock bark for tanning became an important industry. Most of this bark went to Salamanca where an enormous quantity of the bark still lies under sheds, left when the market for this material suddenly declined.

The size of the pines is indicated by the fact that an average butt log cut 1200 board feet at the mills and the average for a tree was 2000 board feet. Lumbering was still an active industry here up to 1918. Following the lumbering of white pine, which did not come back in the form of second growth on the cut-over pine land, various lumber companies operated for hemlock and hardwoods as well as for acid wood. The latter operation made use of everything down to sapling size. Some of these companies built railroads into the region, the grades of which are still plainly visible and in some

places make good trail routes. Bay State (valley and run) is derived from the name of the lumber company of that name, while Frecks, the former post office name of the settlement on upper Quaker run, was derived from the name of the head sawyer of the Bond Lumber Company.

AGRICULTURE

In proportion to the area, agriculture occupies a minor position as compared with the region north and west of the Allegheny valley. This is due to the very limited extent of soils favorable for agricultural operations. Most of the fertile soils occupy slopes too steep for farming. Much of the Allegheny valley is occupied by sandy or gravelly benches of sterile or acid soils, interspersed with fertile deltas around the openings of the branch valleys where materials brought down from the Chemung shales of the higher slopes have produced comparatively fertile spots.

The Chemung shales outcrop on the lower slopes of the region. The conglomerate formation is found on the higher ridges and upper slopes, where in some places there are quite extensive areas of nearly level land, but with absolutely sterile acid soil. The results of agricultural attempts on this soil is indicated by the character of the cleared land on Parker hill. That there was a more fertile character to the soil on the conglomerate formation under primeval conditions is probable from a comparison with the vegetation and soil conditions of the semiprimeval forest on the conglomerate immediately south of the Salamanca "Rock City."

It appears from surface geological evidence that there was an enormous outwash of material from the front of the glacial ice during the close of the glacial period. The front of the glacial ice reached the hills along the

western and northern edge of the Allegheny valley and into the branch valleys of the Allegheny, so that this mass of débris was carried chiefly into the valley of the Allegheny river, filling it to a great depth and even serving to dam up the outlets of the branch valleys on the east and south sides of the Allegheny. This accounts in large measure for the absence of any considerable areas of fertile bottomland soil in the Allegheny valley. Where the branch valleys were closed on the park side of the river, temporary lakes were formed and the accumulation of sedimentary clays and alluvial material therein has resulted in the formation of the only real fertile soils to be found now within the park area. With regard to the major portion of this region it is thus evident that the country is better suited to recreational and forestry purposes than for agriculture.

EFFECT OF LUMBERING UPON THE PRESENT VEGETATION

At the present time the most visible effects of the past lumbering and fires which everywhere followed such operations, and in many places the fires were of frequent recurrence, are the rather young and open second growth character of the forest on the more fertile slopes and the thicket formation of oak, chestnut and various shrubs on the sterile soils.

That a most marked change in the character of the vegetation has resulted is not to be doubted. Fortunately we find two or three areas of limited extent within the park which serve to give an approximate idea of the character of the primeval forest. These areas are located about the headwaters of Stoddard brook and Red House creek. They indicate that on the north and east facing moister slopes, hemlock was the dominant tree with a

very limited shrubby undergrowth consisting chiefly of *Viburnum alnifolium* and *Taxus canadensis*. The forest floor in many places was otherwise clear of any conspicuous growth, but certain herbaceous perennials were common, such as *Habenaria orbiculata, Viola rotundifolia, Oxalis Acetosella, Dalibarda repens* etc. The south and west facing slopes being drier contained a larger percentage of hardwoods and a correspondingly larger number of species in the shrubby and herbaceous undergrowth. The character of the primeval forest on the conglomerate formation of the higher ridges we can only guess. It undoubtedly possessed a deeper humus than at present and probably contained the best oak and chestnut of the region as well as a very rich shrubby and herbaceous undergrowth.

From what has been said it is obvious that broadly speaking the plants which prefer open places and thin woods have multiplied greatly since the lumbering operations, while those of the deeper humus of the shaded primeval forest, which have not been able to adapt themselves to the changed conditions, are now greatly circumscribed in their distribution and abundance. We know, however, that the native flora of the primeval forest, with the exception of a comparatively few species, possesses a remarkable capacity for adaptation to changing conditions, if such changes are not too extreme and rapid. If this were not the case very little of the primeval flora of the northeastern states would now be left. Thus while certain species have increased in abundance and others have diminished, only a few have probably entirely passed from the scene.

The Chemung shale, which is the principal geological formation in the region, contains some shell remains and this has contributed to the presence of a slight cal-

careous character to the overlying soils. After lumbering and fire which destroyed much of the humus, the soils were subjected to the leaching effect of heavy rainfall to a degree never experienced in the primeval forest. This has resulted in increased sterility and this process goes hand in hand with the increased acidity of the leafy litter from the second growth hardwood species, due to the more open nature of the woods, permitting the soil to become dried out in periods of intense sunlight instead of decaying into deep fertile humus.

Thus it comes about that we find in the park area not alone an increase of the light-loving species, as compared with the primeval forest, but also an increase of the species preferring sterile and acid soils. It seems to be also true that those species preferring fertile calcareous soils of the dense or moderately dense primeval forest have been considerably circumscribed in their distribution and abundance and are now frequent only in the ravines and along the lower wooded slopes where much of the fertile soil material leached out from the slopes above has found a temporary resting place.

Some of the specific examples of the results of lumbering upon the flora of the region is the increase in the abundance of certain ferns, grasses, sedges, goldenrods, asters, brackberries and other smaller groups. The present survey shows the presence of 43 species of Carex within the park area, exclusive of the adjacent valleys. We can not say with any degree of positiveness that some of these have come into the region since lumbering. A study of some of the semiprimeval areas left shows about the same number of species but in limited abundance. It seems probable, therefore, that most of these species were always here but very limited in distribution and abundance. It is mainly these groups of species, with many

others of like habitat, plants which were rather limited in abundance in the primeval forest, which have now, as a result of the tremendous changes brought about by lumbering, inherited a dominant position in the present flora.

The question naturally arises as to the extent to which the region may recover its former character of vegetation. Extensive fires within the park are probably now to be regarded as a thing of the past, barring unforeseen disaster. The second growth is rapidly becoming denser and larger, shutting out more and more the sunlight from the forest floor. Rainfall is abundant and the soils will increase in permanent moisture and the humus will regain its depth and fertility as this growth progresses. With decreased leaching of the soil on the slopes, which will result from an increase in the density of the forest cover, the soils will also regain some of their former calcareous character derived from the shells in the Chemung shales. Lumbering if continued will be under scientific management. In many places there is evidence that the slopes are already recovering their former character to an astonishing extent, when we consider what has happened here. Before the end of the present century it is probable that the forests of the park will rival in density and beauty the primeval growth, although it may take longer for the pine to return on the lower slopes. A century, however, is but a short time in the history of nature.

PRESERVATION OF NATURAL AREAS

There are certain portions of the park region which because of their location, plant life and the cover they afford to bird and animal life should be maintained as preserves. This applies particularly to the "Big Basin" region including all of the headwaters of the Stoddard brook south to the Bay State road. In this semiprimeval timber the natural vegetation of the region has made its

last stand. This is not merely a fine collection of trees. It is the protection, the home, the sustenance of a wonderfully varied wild life. It is shade, recreation, the source of waters, the home of many birds, shrubs, wild flowers and animal life. The pleasure to be derived from this association is perennial and perpetual as long as the forest shall stand and be protected.

In the lower part of Red House valley is located the last remnant of a small balsam swamp, the only one of its kind south of the Allegheny river in New York. This swamp is the home of a large number of rare plants to be found nowhere else in the region. It and the adjacent bottom-lands should be acquired and set aside as a preserve which will result in a natural increase in the size of the swamp as it regains some of the area cut away.

On the divide between Quaker run and Bay State creek, extending from above English run westward to the line of the Indian reservation is another large area, much of it timbered, which should constitute a preserve for the protection of the wild life and plants thereon.

CATALOG OF PLANTS

The following list of plants includes not only those of the park region proper, but also the plants of the adjacent Allegheny and Tunungwant valleys and a small portion of the terminal moraine region about Randolph and Steamburg. The relative abundance and soil preferences are given for each species so far as that could be ascertained from the survey made of the region, a survey admittedly incomplete. Particular mention is made of those species found only in the glaciated region or in the Tunungwant and Allegheny valleys but not in the park area. Three species, *Carex Emoryi, Scutellaria canescens* and *Hieracium Greenei* are definitely recorded in New York State for the first time. A more extended study of the

region especially in spring and early summer and in the late fall will doubtless serve to add considerably to the present list of species.

The scientific names of the families, genera and species are as a rule those found in the seventh edition of Gray's Manual in order to correlate the names with those of the most convenient manual for use in the field. Where a departure is made from these names, reference is usually made to the place of publication of the reasons for such change, and the name used in Gray's Manual is given in synonymy. Otherwise synonyms are included only where their omission might lead to confusion on the part of those using that manual in the field.

The names of plants which appear to be native to this region are printed in heavy type, while the names of plants which are naturalized or adventive from some other country or from some other portion of America are printed in light-faced capitals. Synonyms are printed in italics. The common names of the plants are likewise taken from Gray's Manual, supplemented by those used in Wiegand & Eames', Flora of the Cayuga Lake Basin, New York (1926) and from Britton & Brown's Illustrated Flora (second edition, 1913).

The authors are under obligation to Carleton R. Ball of the United States Department of Agriculture for the determination of the species of Salix, to Kenneth K. Mackenzie for the determination of Carex material collected in the park region, to Neil Hotchkiss for the determination of the grasses, to Eileen W. Erlanson for the determination of the roses, to Frank W. Johnson of Buffalo for a number of additional records of plants collected by him in the park, and to others who have contributed valuable suggestions, information and photographs.

Division 1 **PTERIDOPHYTA**

POLYPODIACEAE (Fern Family)

Cystopteris fragilis (L.) Bernh. Brittle Fern

Uncommon or rare and confined chiefly to moist rocky situations. Rocks above north side of Quaker run.

Pteretis nodulosa (Michx.) Nieuwl., *Onoclea Struthiopteris,* Gray's Man., See Am. Midland Nat. 4: 334. 1916. Ostrich Fern

In moist alluvial soil of open woods and thickets along the Allegheny and Tunungwant valleys. Infrequent.

Onoclea sensibilis L. Sensitive Fern

In moist or wet soil of open places, thickets and thin woods along most of the stream courses and in swamps and marshes. Common.

Thelypteris Dryopteris (L.) Slosson, *Phegopteris Dryopteris,* Gray's Man. Oak Fern

In moist fertile humus of ravines and shaded woods and thickets, shaded mossy rocks and sphagnum swamps. Rare. Found by Frank W. Johnson on Coon run and upper Quaker run.

The generic name *Thelypteris,* in place of either *Aspidium* or *Dryopteris,* is adopted here, see Nieuwland, Am. Midland Nat. 1: 226. 1910, and to it is united the genus *Phegopteris,* see Weatherby, Rhodora 21: 179. 1919.

Thelypteris hexagonoptera (Michx.) Weatherby, *Phegopteris hexagonoptera* Fee. Broad Beech Fern

In sterile soil, usually gravelly or sandy, in open woods, thickets and on banks, frequent on or ad-

jacent to the conglomerate formation of the higher ridges and slopes.

Thelypteris Phegopteris (L.) Slosson. *Phegopteris polypodioides* Fee. Long Beech Fern.

Moist humus in ravines, open woods and on rocky banks. Rare. Reported by Mr Johnson.

Thelypteris palustris Schott., *Aspidium Thelypteris* Sw. Marsh Shield Fern

Common in swamps and marshes along the edge of the glacial drift near Steamburg and Randolph. Balsam swamp in Red House valley. Otherwise absent from the park area, but to be looked for in the larger valleys.

Thelypteris noveboracensis (L.) Nieuwl., *Aspidium noveboracense* (L.) Sw., *Dryopteris noveboracensis* Gray. New York Fern

In moist humus of sterile or but slightly fertile soils in open woods, on banks and in thickets. Very common.

Thelypteris marginalis (L.) Nieuwl., *Aspidium marginale* Sw., *Dryopteris marginalis* Gray. Marginal Shield Fern

In open woods, on wooded slopes and on or about shaded rocky places. Frequent above the lower valleys.

Thelypteris Goldiana (Hook.) Nieuwl., *Aspidium Goldianum* Hook., *Dryopteris Goldiana* Gray. Goldie's Fern

In rich moist humus of woodlands and slopes. Rare. Woods near Buffalo camp on Quaker run, Limestone cove near Onoville, headwaters of Stoddard brook etc.

Thelypteris cristata (L.) Nieuwl., *Aspidium cristatum* Sw., *Dryopteris cristata* Gray. Crested or Swamp Shield Fern

In wet lowland woods, sedgy swamps and bogs. Infrequent. Low woods near Quaker Bridge, "Balsam swamp" in Red House valley etc.

Var. **Clintoniana** (D. C. Eaton) Weatherby. In similar situations and also in moist, less acid soil or damp woodlands. Rare. Woods near Buffalo camp on Quaker run, growing with *T. Goldiana.*

Thelypteris spinulosa (O. F. Mull.) Nieuwl., *Aspidium spinulosum* Sw., *Dryopteris spinulosa* Kuntze. Spiny-toothed Shield Fern

In moist open or shaded forested areas. Infrequent. Rock City north of Salamanca

Var. **intermedia** (Muhl.) Weatherby, *Aspidium spinulosum* var. *intermedium* D. C. Eaton, *Dryopteris intermedia* Gray. Common Wood Fern

In fertile or often somewhat sterile soil in moist or damp, often dry woodlands, thickets and on open banks. Very common.

Polystichum acrostichoides (Michx.) Schott. Christmas Fern

In either moist or dry, usually rocky woodlands and banks. Frequent.

Dennstaedtia punctilobula (Michx.) Moore. *Dicksonia punctilobula* of Gray's Man. Hay-scented Fern

In sterile, gravelly or sandy soil of cut-over land, open places, thickets and banks, usually in dry but often in damp situations. Common.

Athyrium angustifolium (Michx.) Milde, *Asplenium angustifolium* Michx., *Athyrium pycnocarpon*

(Spreng.) Tidestrom. Narrow-leaved Spleenwort

In moist or wet, deep rich humus of rocky woodlands, ravines and slopes. Rare. Limestone cove near Onoville.

Athyrium acrostichoides (Sw.) Diels., *Asplenium acrostichoides* Sw., *Asplenium thelyperoides* Michx. Silvery Spleenwort

In situations similar to the preceding species but more frequent and sometimes in alluvial soil.

Athyrium angustum (Willd.) Presl., *Asplenium Filix-foemina* of Gray's Man. etc.

In wet or moist places in open woods or along streams. Common and presenting several varying forms, of which the var. **rubellum** (Gilbert) Butters, is most often seen in the park area and the var. **elatius** (Link) Butters, in the Tunungwant valley.

Adiantum pedatum L. Maidenhair Fern

In fertile humus of moist forested areas. Frequent.

Pteridium latiusculum (Desv.) Maxon. *Pteris aquilina,* Common Brake, Gray's Man. See Am. Fern Jour. 9:43, 1919.

In dry, or rarely moist, gravelly and sandy soil, sometimes in more fertile situations. Very common in most sections of the park area.

Polypodium virginianum L., *P. vulgare,* Gray's Man. Common Polypody

On moist or dry shaded ledges and rocks, rarely on logs. Common in many places throughout the park area.

OSMUNDACEAE (Flowering Fern Family)

Osmunda regalis L. Royal Fern

Infrequent in wet soil along the Allegheny and Tunungwant valleys and in the bogs and marshes along the edge of the glacial drift near Steamburg.

Osmunda Claytoniana L. Interrupted or Clayton's Fern

Frequent in moist soil in woods, thickets and open places.

Osmunda cinnamonea L. Cinnamon Fern

Common in wet woods, along streams and in marshy places.

OPHIOGLOSSACEAE (Adder's Tongue Family)

Ophioglossum vulgatum L. Adder's Tongue

In sandy, acid or poorly drained soil. Very rare. Near Quaker Bridge, Stetson pond near Randolph.

Botrychium angustisesegmentum (Pease & Moore) Fernald. (*B. lanceolatum*). Lance-leaved Grape Fern

Occasional in damp acid litter of open woods and thickets. Breed's run, Blacksnake mountain, Quaker run, Pine hill etc.

Botrychium ramosum (Roth) Aschers., *B. neglectum* Wood, *B. matricariaefolium* A. Br. Matricary Grape Fern.

Frequent in open woods, thickets and on banks, usually in gravelly or rather sterile soil.

Botrychium obliquum Muhl. Ternate Grape Fern

Uncommon or rare in woods, thickets and on banks, usually in poor soil. In the same or similar situations sometimes occurs the var. **dissectum** (Spreng.) Clute.

Botrychium ternatum (Thunb.) Sw., var. **intermedium** D. C. Eaton. Leathery Grape Fern

Occasional on the more acid soils of the higher ridges. Not collected in mature condition and possibly to be referred to *B. obliquum* var. *oneidense* (Gilbert) Waters.

Botrychium virginianum (L.) Sw. Rattlesnake Fern

Common in most of the rather open forested areas of mixed growth.

EQUISETACEAE (Horsetail Family)

Equisetum arvense L. Common Horsetail

Common along railroad embankments, roadsides and recently disturbed soil; elsewhere uncommon or rare.

Equisetum sylvaticum L. Wood Horsetail

Common in low or wet woods and thickets, sometimes in wet, open situations, and in this region, confined chiefly to the lower valleys of Quaker run, Red House, and the Allegheny and Tunungwant valleys.

Equisetum hyemale L. Scouring Rush

Locally common on banks and in sandy thickets of the Allegheny valley. Erie Railroad embankment a mile north of Quaker Bridge, sandy banks opposite Red House, Stetson pond etc., apparently the var. **affine.**

LYCOPODIACEAE (Club Moss Family)

Lycopodium lucidulum Michx. Shining Club Moss

Common in damp forested areas.

Lycopodium annotinum L. (figure 3). Stiff Club Moss

Locally common on rocks and banks in rather open situations, chiefly above 1800 feet altitude, Stony brook trail, rocks on the divide between Red House and Limestone valleys, Blacksnake mountain trail, Cayuga mountain etc.

Lycopodium clavatum L. Running Pine

Frequent in rather poor soil in open woods, thickets and on banks, chiefly above 1500 feet altitude.

Lycopodium obscurum L. Ground Pine

Common in open woods, clearings and thickets, often on banks, usually in gravelly or sandy soil.

Lycopodium complanatum L. var. **flabelliforme** Fernald. Trailing Ground Pine

Common in open woods and on banks, usually in rather poor soil.

Lycopodium tristachyum Pursh. Ground Pine

In sandy or sterile gravelly soil. Uncommon or rare. Summit on Stony brook trail, Parker hill, Wolf hill etc.

(Photo by S. C. Bishop, New York State Museum)

Figure 3 Stiff Club Moss, *Lycopodium annotinum*

Division 2 SPERMATOPHYTA

Subdivision 1 Gymnospermae

TAXACEAE (Yew Family)

Taxus canadensis Marsh. American Yew, Ground Hemlock

In low, moist humus, usually under hemlocks or other conifers. Rare. Woods along Quaker run, woods near Quaker Bridge, tall timber on upper headwaters of Red House creek, headwaters of Stoddard brook, Tunungwant valley etc.

PINACEAE (Pine Family)

Pinus Strobus L. White Pine

According to old residents of the region, once a common forest tree on most of the lower slopes and in the valleys. Now confined to a few scattering trees within the park area, and a fair-sized grove of second growth young trees on a slope along the lower part of Quaker run. Occasional trees are also to be seen in the Allegheny valley.

Larix laricina (DuRoi) Koch. American Larch, Tamarack

Not found within the park area and known only in some of the swamps and bogs along the edge of the glacial drift near Steamburg and Randolph.

Picea mariana (Mill.) BSP. Black or Bog Spruce

Not found within the park area, and like the Tamarack found only in swamps along the edge of the glacial drift. Saunders, (Roosevelt Wild Life Bulletin 1:255, 1923) lists this as a tree of the park area, but there are no native spruce trees in

the region nearer than the Steamburg bog, and *Picea excelsa* is a planted tree about dwellings.

Abies balsamea (L.) Mill. Balsam. Fir

Within the park area found only in a small swamp in Red House valley to which the name "Balsam swamp" has been given. Northward and westward it is found in the swamps along the edge of the glacial drift near Steamburg.

Tsuga canadensis (L.) Carr. Hemlock

Common in all the wooded areas of the park region but rare or absent from the bottomlands of the Allegheny river and the Tunungwant creek. The only common conifer of the region.

Juniperus virginiana L. Red Cedar

Very rare. A single tree on a hillside in the lower part of Quaker run valley.

Subdivision 2 **Angiospermae**

Class 1. MONOCOTYLEDONEAE

TYPHACEAE (Cattail Family)

Typha latifolia L. Broad-leaved Cattail

Alluvial marshy places. Rare. Apparently frequent only in the Tunungwant creek valley (see figure 26). Often with narrow leaves and the staminate and pistillate spikes separated by 1–2 cm. Also a form with contiguous spikes only 14–18 mm thick and leaves 8–15 mm broad, simulating *Typha angustfolia* L., but in all material examined the pollen grains were in 4's. There are many suitable situations for the cattail in the Allegheny valley near Quaker Bridge, Cold Spring etc., but none was seen

SPARGANIACEAE (Bur Reed Family)

Sparganium eurycarpum Engelm. Giant Bur Reed

Common in a marsh on the south edge of Randolph, and while there are many suitable situations in the Allegheny valley, it was not seen elsewhere in the region.

Sparganium americanum Nutt. Bur Reed

In wet places in the Tunungwant valley and rarely in the Allegheny valley.

NAJADACEAE (Pondweed Family)

Potamogeton epihydrus Raf. Pondweed

Frequent in the Tunungwant creek, and perhaps elsewhere in the quiet waters of the Allegheny river, but the discharge of oily waste into the rivers of this region has doubtless destroyed many of the aquatics which may once have flourished here.

ALISMACEAE (Water Plantain Family)

Alisma Plantago-aquatica L. Water Plantain

In muddy ditches and swamps, usually in clayey or alluvial soil. Infrequent or rare and observed only in lower Red House valley. Tunungwant valley and along the Allegheny river.

Sagittaria latifolia Willd. Arrow-leaf, Arrow-head

Common in ditches, marshes and wet, usually alluvial soil along the Allegheny river and Tunungwant creek. The very distinct var. **obtusa** (Muhl.) Wiegand, occurs at Cold Spring and in the bayous of the Tunungwant valley.

HYDROCHARITACEAE (Frog's Bit Family)

Elodea canadensis Michx. *Philotria canadensis* Britt. Water-weed

Specimens of what is apparently this species, but not in prime condition, collected at Stetson pond near Randolph, outside the park area.

GRAMINEAE (Grass Family)

DIGITARIA ISCHAEMUM Schreb., *D. humifusa.* Low Crab Grass

Roadsides, embankments and paths, in light or sandy soil. In this region confined chiefly to railroads.

DIGITARIA SANGUINALIS (L.) Scop. Finger Grass, Crab Grass

A weed of cultivated soils and waste places.

Panicum capillare L. Old Witch Grass

Rare in cultivated soil and waste places, and noted only in the Tunungwant valley, where it may not be native.

Panicum clandestinum L. Deer-tongue Grass

In moist thickets and banks chiefly in alluvial soil. Common in the Allegheny and Tunungwant valleys; elsewhere scarce.

Panicum dichotomum L. Forked Panic Grass

In woodlands and thickets. Common.

Panicum huachucae Ashe. Hairy Panic Grass

In moist or rather dry soil, both fertile and sterile in nature, almost everywhere common except in the most densely forested areas. All the specimens collected belong to the var. **silvicola.**

Panicum implicatum Nash. Panic Grass

In dry soil of fields and open woods. Infrequent. Quaker run near entrance to park (Frank W. Johnson)

Panicum latifolium L. Broad-leaved Panic Grass

In moist open woods and thickets, often in rather poor soil. Uncommon. Quaker run, Huckleberry hill etc.

Panicum linearifolium Scribn. Low White-haired Panic Grass

In sterile or sandy soil, and in this region confined chiefly to such soils in the Allegheny valley, Huckleberry hill, Elko mountain etc.

ECHINOCHLOA CRUSGALLI (L.) Beauv. Barnyard Grass

A weed of rather fertile soils in cultivated sections. Seen at Quaker Bridge, Steamburg, Salamanca etc., but apparently rare or absent from most of the park area.

SETARIA LUTESCENS (Weigel) Hub., *S. glauca.* Golden Foxtail

A weed of cultivated lands and waste places, but rare within the park area.

SETARIA VIRIDIS (L.) Beauv. Green Foxtail, Bottle Grass

In situations similar to the preceding, and more common especially along railroads.

Leersia oryzoides (L.) Sw. Rice Cut-grass

Common in wet alluvial soil, marshes and river banks along the Allegheny river, Tunungwant creek and the lower valleys of Quaker run, Red House etc.

ANTHOXANTHUM ODORATUM L. Sweet Vernal Grass

Locally common in poor or sterile soil of fields, roadsides and open woods. Bee Hunter creek.

Milium effusum L. Wild Millet Grass

In moist or low woodlands, usually in rather rich soil, common. Saunders (Roosevelt Wild Life Bulletin 1:270, 1923) reports *Aristida dichotoma* as a

common grass of dry hillsides, which was not collected in the progress of this survey.

Oryzopsis asperifolia Michx. Mountain Rice

In rather dry, somewhat sterile soils of the hills along the Allegheny river and occasional on the higher ridges and summits. Huckleberry hill, Elko mountain, Bradford road near state line, Butler hill etc.

Brachyelytrum erectum (Schreb.) Beauv. Bearded Short-husk

In moist or rocky woodlands, chiefly in rich humus or fertile soil. Common.

PHLEUM PRATENSE L. Timothy, Herd's Grass

Fields, roadsides and other grassy places, usually in rich soil. Rare outside of the cultivated areas of the park region.

AGROSTIS CANINA L. Brown Bent Grass

Fields. Rare and doubtless introduced with other grass seed. Cain hollow.

Agrostis hyemalis (Walt.) BSP. Hair Grass

Common in dry or damp situations in the open or even in woods and thickets, sometimes in swamps.

AGROSTIS ALBA L. *A. palustris* Huds. Fiorin, White Bent, Red Top

Common almost everywhere in a variety of soil conditions, although most abundant in fields and open places.

Agrostis perennans (Walt.) Tuckerm. Thin Grass

In dry or damp open woodlands, usually in rather poor or sterile soil. Very common.

Calamagrostis canadensis (Michx.) Beauv. Blue-joint Grass

Common in marshes and in mucky or wet alluvial

soil, in this region confined to the lower valleys of Quaker run and Red House, where it is a characteristic streamside grass, and in the Tunungwant and Allegheny river valleys. Increasingly abundant northward in the glaciated region.

Cinna arundinacea L. Sweet Reed Grass

In moist woodlands and swamps, not found within the park area but seen in the Tunungwant and Allegheny valleys and in the swamps along the margin of the glacial drift.

Cinna latifolia (Trev.) Griseb. Slender Reed Grass

Frequent and widely distributed throughout the wooded areas of the region, chiefly in moist or wet ravines, stream banks and moist woods.

Holcus lanatus L. Velvet Grass

Fields and roadsides, usually in moist rich soil. Infrequent but spreading.

Avena sativa L. Cultivated Oat

Sometimes springing up along woodland roads and elsewhere, but not naturalized.

Danthonia compressa Austin. Flattened Wild Oat Grass

In open woods, fields and banks, usually in rather hard or poor soil. Frequent.

Danthonia spicata (L.) Beauv. Common Wild Oat Grass

In dry, sterile soil of hillsides, clearings and old fields, and in these situations the most abundant grass of the park region.

Eragrostis peregrina Wiegand. Wandering Love Grass

A weed along the railroad near Quaker Bridge. Native country unknown, see Rhodora 19:93. 1917, and 21:133, 1919.

Melica striata (Michx.) Hitchc., *M. purpurascens* (Torr.) Hitch., *Avena Torreyi* Nash, *Bromelica striata* (Michx.) Farwell. Purple Oat

Frequent in dry or moist open forested areas, and especially in rocky situations such as the ledges above the north side of Quaker run.

DACTYLIS GLOMERATA L. Orchard Grass

Fields, meadows and roadsides in the cultivated areas of the region, very rarely along wood roads, where probably not long persistent.

POA COMPRESSA L. Canada Blue Grass, Wire Grass

In fields and woods, usually but not always in sterile soil. Not common.

POA ANNUA L. Low Spear Grass

In cultivated and waste soil, and especially in dooryards and lawns.

Poa nemoralis L. Meadow Grass

Usually in dry soil of open places, rare, and only observed as yet east of the park area.

Poa saltuensis Fernald & Wiegand, Rhodora 18:235, 1916. Woodland Spear Grass

Occasional in moist or rather dry humus of the wooded areas, especially along Quaker run.

Poa palustris L., *P. triflora* in Gray's Man. Fowl Meadow Grass

Common in open or somewhat shaded situations or in moist fields, either in poor or fertile soil throughout the region.

POA PRATENSIS L. June Grass, Kentucky Blue Grass

Common or abundant in fields, roadsides and in waste places, generally in fairly fertile soils.

Glyceria canadensis (Michx.) Trin. Rattlesnake Grass

In marshy places and bogs. Not observed within the park area, but frequent northward around Randolph, Steamburg etc. in swamps along the edge of the glacial drift.

Glyceria nervata (Willd.) Trin. Meadow Grass, Manna Grass

In moist or wet, fertile soil of open woodlands, borders and meadows. Common.

Glyceria grandis Wats. Reed Meadow Grass

In wet meadows, marshes and ditches. Frequent in the Allegheny and Tunungwant valleys and up the larger streams of the park area.

Glyceria melicaria (Michx.) Hub., *Glyceria elongata* Trin., *G. Torreyana* (Spreng.) Hitch., *Panicularia melicaria* Hitch. Long Manna Grass

In moist or wet woods and along streams and wooded swamps, chiefly in fertile soil. Common

Glyceria pallida (Torr.) Trin. Pale Manna Grass

In wet woods, swamps, ditches and borders of streams. Infrequent and apparently confined to the Tunungwant and Allegheny valleys surrounding the park area.

FESTUCA CAPILLATA Lam., *F. ovina* var. *capillata* (Lam.) Hack.

Sterile, rocky soil. Rare. Chiefly in open woods, along trails on the conglomerate soils of the higher ridges.

FESTUCA ELATIOR L. Taller or Meadow Fescue

Fields, roadsides and open woods. Common.

Festuca nutans Spreng., *F. obtusa* Spreng. Nodding Fescue Grass

In moist woods and copses, most abundant in rocky situations. Rather common and one of the

most conspicuous grasses of the forested areas of the park region.

Bromus secalinus L. Cheat or Chess

Fields and waste places. Common especially along the railroads of the Allegheny valley.

Bromus purgans L. Hairy Wood Chess

Frequent in moist woods and on banks of the larger valleys, elsewhere rare. The forma *glabriflorus* Wiegand, Rhodora 24:92. 1922, occurs on Elco and Three Sisters mountains, and doubtless elsewhere.

Bromus ciliatus L. Fringed Brome Grass

Frequent or common in moist open forested areas and on banks in rather fertile soil.

Bromus altissimus Pursh. Tall Wood Chess

Frequent in alluvial soil of river and stream banks. Elko region, Red House valley etc.

LOLIUM PERENNE L. Common Darnel

Rare or absent in the park area, but common in fields and roadsides about Salamanca, Randolph etc.

AGROPYRON CANIUM (L.) Beauv. Awned Wheat Grass

Common in fields, meadows and on dry banks along the Allegheny valley

AGROPYRON REPENS (L.) Beauv. Quack Grass, Couch Grass

Cultivated fields, gardens, roadsides, banks and meadows, in either fertile or rather sterile soil. Frequent in the populated areas, elsewhere rare.

Elymus virginicus L. Virginia Wild Rye

Frequent along the bottom lands of the Allegheny river and Tunungwant creek in alluvial soil.

Elymus riparius Wiegand, Rhodora 20:81, 1918. Streamside Wild Rye

Common along most of the smaller streams in shaded situations in alluvial soil of the woods and ravines.

Elymus australis Scribn. & Ball. Southern Wild Rye

Alluvial river and stream banks, usually in shaded situations. Frequent along the Allegheny river and Tunungwant creek, but only the var. **glabriflorus** Wiegand, Rhodora 20:84, 1918.

Elymus canadensis L. Northern Wild Rye

Alluvial stream and river banks. Rare. Found only near Elko, but to be looked for elsewhere.

Hystrix patula Moench, *Asprella Hystrix* (L.) Humb. Bottle-brush Grass

Frequent in dry or damp woodlands and rocky slopes, often in gravelly soil of thickets along streams.

CYPERACEAE (Sedge Family)

Cyperus esculentus L. Yellow Nut Grass

Locally frequent in cultivated or recently cultivated fields of the Tunungwant and Allegheny valleys.

Cyperus strigosus L. Straw-colored Nut Grass

In low or moist open situations in the Allegheny valley. Infrequent.

Eleocharis obtusa (Willd.) Schultes. Spike Rush

Frequent in wet, marshy or muddy situations; very rare however, in the higher parts of the park area.

Eleocharis palustris (L.) R. & S. Spike Rush

Open wet soil and among tangled vegetation around pools in the Tunungwant valley, a very slender, green form. More typical forms probably occur elsewhere.

Eleocharis acicularis (L.) R. & S. Needle Spike Rush

Wet or muddy soil along slow streams and borders of pools in the Tunungwant and Allegheny valleys.

Scirpus validus Vahl. Great Bulrush

In shallow water of marshes and pools of the Allegheny valley (Cold Spring), and more abundant northward and westward toward Randolph on the edge of the glacial drift.

Scirpus atrovirens Muhl. Dark-green Bulrush

In marshes, wet meadows and along streams, in the park area confined to the lower courses of the principal streams and the Allegheny valley, while the var. **georgianus** (Harper) Fernald, Rhodora 23:134, 1921, occurs in moist open woods, or wet fields and openings of the less fertile soils and higher elevations.

Scirpus polyphyllus Vahl. Leafy Bulrush

In springy meadows, wet openings in the forest and along streams. Apparently frequent and generally distributed.

Scirpus cyperinus (L.) Kunth. Wool Grass

In wet or marshy places of the uplands and along the principal streams of the park. Infrequent. More abundant and becoming common outside the park area along the edge of the glacial drift, chiefly the var. **pelius** Fernald.

Scirpus pedicellatus Fernald. Pedicelled Wool Grass

In wet or marshy places. Common in the Tunungwant valley and locally in the Allegheny valley. Not observed in the uplands of the park area.

Scirpus atrocinctus Fernald. Northern Wool Grass

In situations similar to the preceding but rare and observed only on Pine hill, west of the park.

Eriophorum virginicum L. Cotton Grass

In acid soil or bogs, along the edge of the glacial drift west and north of the park area near Steamburg.

Rynchospora alba (L.) Vahl. White Beaked Rush

In a bog near Steamburg. Not found within the Park.

Dulichium arundinaceum (L.) Britton. Dulichium

In wet soil along the margins of ponds and swamps. Rare in the Tunungwant valley at Limestone, bogs near Randolph, Steamburg etc.

Carex aestivalis M. A. Curtis. Sedge

Moist wooded banks and shaded rocky slopes. Frequent. The species of Carex are indiscriminately known as "sedges" and no attempt is made here to give each one a distinctive common name, although such names may be found in Britton & Brown's Illustrated Flora. The species of Carex collected in and about the Allegany State Park area have been identified by K. K. Mackenzie, and those names have been retained in this list, with the names as given in the seventh edition of Gray's manual added wherever possible.

Carex angustior Mackenzie, *C. stellulata* var. *angustata* Carey.

In acid bogs and swamps. Balsam swamp in Red House valley. Rare.

Carex annectans Bicknell, *C. setacea* var. *ambigua* (Barratt) Fernald.

In damp, somewhat sandy soil of the Tunungwant valley near Limestone. Rare.

Carex Baileyi Britton, *C. lurida* var. *gracilis* (Boott) Bailey.

In wet soil along streams, woodland roads and open places. Common throughout most sections of the park area above the lower valleys.

Carex brachyglossa Mackenzie, *C. annectens* var. *xanthocarpa* (Bickn.) Wiegand, Rhodora 24:74, 1922.

In sterile, sandy or gravelly soil of open places. Infrequent. Stony brook trail, Quaker Bridge etc.

Carex bromoides Schk.

In shaded or rather open wet mossy places, marshes and swales. Upper part of Quaker run etc.

Carex brunnescens (Pers.) Poir.

In swamps, marshes and moist or wet rocky places. Infrequent.

Carex canescens L.

In acid bogs along the edge of the glacial drift near Steamburg. Not found within the park area.

Carex cephaloidea Dewey.

Wooded slopes, banks and damp thickets. Infrequent. Headwaters of Stoddard brook, near Quaker Bridge etc.

Carex cephalophora Mulh.

In open woods, rocky banks and thickets in poor soil. Infrequent. Woods near Quaker Bridge, slopes of Elko mountain, Huckleberry hill etc.

Carex comosa Boott.

Shores of Stetson pond near Randolph. Not found within the park area.

Carex communis Bailey.

Common in open woodlands and on banks in fertile or somewhat sterile humus.

Carex convoluta Mackenzie, *C. rosea* of Gray's Man. ed. 7.

Dry woods and banks in fertile or somewhat sterile soil. Frequent.

Carex crinita Lam.

Wet soil of marshes and borders of ponds and streams. Confined apparently in this region to the lower valleys.

Carex Deweyana Schw.

Moist or somewhat dry humus of fertile wooded areas often in rocky situations. Frequent.

Carex digitalis Willd.

Moist or dry, fertile or somewhat sterile humus of open woods and banks. Frequent.

Carex Emoryi Dewey.

In wet places and shallow water along the Allegheny river south of Quaker Bridge. Rare and apparently the first record for this sedge in New York State.

Carex flexuosa Muhl., *C. debilis* var. *Rudgei* Bailey.

In moist woods and swamps. Infrequent. Along Stony run trail, borders of the tall timber at Halls, swamp in Red House valley, Olean Rock City etc.

Carex foenea Willd.

In rather dry, sterile soil of the Olean conglomerate formation on the higher ridges. Infrequent. Rocks on the divide between Limestone and Red House, summit along the Bradford road etc.

Carex folliculata L.

In bogs and swamps, usually acid in nature. Rare and found only in the "Balsam swamp" in Red House valley, but common in the swamps and bogs west and north of the park area along the edge of the glacial drift.

Carex gracillima Schw.

In moist, fairly fertile humus of open woods, thickets and banks. Frequent.

Carex grisea Wahl.

A plant usually of damp woodlands and banks, but in this region seen only in a moist open field on the bottomlands of the Tunungwant creek at Limestone.

Carex gynandra Schw.

Usually found in swamps, bogs and swales. Rare and in this region seen only in the "Balsam swamp" of the Red House valley.

Carex heterosperma Wahl., *C. anceps* Muhl., *C, laxiflora* var. *patulifolia* (Dewey) Carey.

Occasional in rather poor soil of rocky wooded slopes and banks. Rocks above north side Quaker run, woods on slope of Elko mountain etc.

Carex hirtifolia Mackenzie, *C. pubescens* Muhl.

Dry fields, banks and open woodlands. Rare. Collected at Carrollton by Peck.

Carex hystricina Muhl.

A plant of swamps, marshes and bogs or boggy meadows, unknown within the park area, but found at Stetson pond and elsewhere along the margin of the glacial drift.

Carex incomperta Bicknell, *C. sterilis,* in part, Gray's Man.

Wooded swamps and bogs. Rare and in this region found only north and west of the park area in the bogs along the edge of the glacial drift near Steamburg, Randolph etc.

Carex intumescens Rudge.

Borders of swamps and swales, usually somewhat acid in nature but also in wet places in open woods of more fertile soil. Common and generally distributed both in the park area and in the glaciated region.

Carex lacustris Willd., *C. riparia* Curt.

In marshes and swales of the bottomlands of the Tunungwant and Allegheny valleys. Occasional.

Carex laxiculmis Schw.

In moist humus of woodlands throughout the park area but not common.

Carex laxiflora Lam.

Moist woods and banks. Rare. Collected by Peck at Carrollton.

Carex leptalea Wahl.

Wet mossy or boggy places, usually in more or less shade. Locally common on upper Quaker run, "Balsam swamp" in Red House valley, headwaters of Red House creek etc.

Carex leptonervia Fernald, Rhodora 24:189, 1922.

Moist or rocky woodlands, slopes and wooded marshes. Frequent or common throughout the park area.

Carex lupulina Muhl.

In wet meadows, marshes and swamps of the Tunungwant and Allegheny valleys, but very rare or absent in the higher portions of the park area.

Carex lurida Wahl.

In wet soil or moist depressions and swamps, in regions of both fertile and sterile soil, and generally common throughout the park area.

Carex normalis Mackenzie, *C. mirabilis* Dewey.

Moist, fertile soil and humus of open forested areas throughout the park area. Frequent.

Carex pallescens L.

Frequent in damp fields and on banks in rather sterile sandy or gravelly soil.

Carex pennsylvanica Lam.

In dry or sterile soil of rocky slopes, ridges and banks. Infrequent. Red House valley, slopes of Elko mountain, Huckleberry hill etc., and sometimes in acid bogs, as the "Balsam swamp" in Red House valley.

Carex plantaginea Lam.

In rich, moist humus of wooded areas. Infrequent. Woods along Quaker run etc.

Carex platyphylla Carey.

On rocky or dry, wooded or rather open slopes. Rare. Slopes of Elko mountain.

Carex prasina Wahl.

Common in wet places along most of the streams of the park area.

Carex projecta Mackenzie, *C. tribuloides* var. *reducta* Bailey.

In moist or wet fertile soil along streams, in open woods and wet meadows. Common.

Carex radiata (Wahl.) Small.

In dry thickets, open woodlands and on banks. Frequent in the higher parts of the park area and also in "Balsam swamp" in Red House valley where the soil conditions are undoubtedly acid.

Carex rosea Schk.

In moist soil of open woods and thickets. Uncommon. Tunungwant valley near Limestone and perhaps elsewhere.

Carex scabrata Schw.

In wet or marshy places in woods or along streams. Common.

Carex scoparia Schk.

In low or moist meadows, fields and especially in exsiccated depressions. Common. Rare in open woods.

Carex sparganioides Muhl.

In rich humus of open woods and wooded slopes. Rare. Woods along Stony brook trail.

Carex stipata Muhl.

In wet or marshy places, either open or wooded, or along the borders of streams and pools. Common.

Carex torta Boott.

In wet gravelly or stony places in and along the borders of all of the streams of the park area above the Tunungwant and Allegheny valleys.

Carex tribuloides Wahl.

In moist or wet, poorly drained meadows, swamps and borders of pools, frequent in the Allegheny and Tunungwant valleys and the lower portions of Red House and other valleys of the park area, but absent from the higher portions of the park.

Carex trichocarpa Muhl.

In open or somewhat shaded marshes and swales. Occasional. Near Quaker Bridge, Tunungwant valley near Limestone, "Balsam swamp" in Red House valley.

Carex trisperma Dewey.

In wet, shaded, sphagnous places. Rare. "Balsam swamp," Red House valley, var. **Billingsii** Knight. in sphagnum bog near Steamburg.

Carex Tuckermani Boott.

In wet or marshy, often exsiccated depressions. Frequent in the Allegheny and Tunungwant valleys but otherwise absent from the park area.

Carex virescens Muhl.

In dry, open woods and banks, usually in rather poor soil. Occasional, but more often found on the conglomerate soils in the higher portions of the park area.

Carex vulpinoidea Michx.

Wet meadows, swales and marshy borders of pools. Frequent, especially in the lower valleys.

ARACEAE (Arum Family)

Arisaema triphyllum (L.) Schott. (figure 4). Indian Turnip, Jack-in-the-Pulpit

In moist or wet rich humus of wooded ravines, and shaded borders of swamps or in low wet woods, generally distributed and common except on the poor soils of the conglomerate formation in the higher portions of the park.

Arisaema Dracontium (L.) Schott, is reported from Salamanca by Day (Cat. Plants of Buffalo & Vic. 137. 1882).

Calla palustris L. Wild Calla

Shaded or open wet places around the borders of or in acid bogs and lowland swamps. Rare. Tunungwant valley, bog near Steamburg.

Acorus Calamus L. Sweet Flag

In wet or springy places, usually in the open. Rare. Quaker run valley below Frecks.

(Photo by New York State Museum)

Figure 4 Jack-in-the-Pulpit or Indian Turnip, *Arisaema triphyllum*

LEMNACEAE (Duckweed Family)

Lemna minor L. Smaller Duckweed

Floating on quiet water of pools, marshes and ditches. Common in the Allegheny and Tunungwant valleys, pond on Pine hill and elsewhere. In the park area proper suitable habitats for this plant are very rare.

Spirodela polyrhiza (L.) Schleid. Greater Duckweed

Floating on the quiet waters of pools and backwaters in the Tunungwant and Allegheny valleys. Frequent. Near Cold Spring, Limestone etc.

JUNCACEAE (Rush Family)

Juncus effusus L. Soft or Bog Rush

In wet soil on the borders of marshes, low meadows and ditches. Common except in the higher portions of the park (varieties **solutus** Fernald & Wiegand and **Pylaei** (Laharpe) Fernald & Wiegand, only).

Juncus bufonius L. Toad Rush

In silty or muddy ditches and borders of pools. Infrequent. Roadside between Quaker Bridge and Steamburg, roadside between Elkdale and Salamanca Rock City, doubtless elsewhere.

Juncus tenuis Willd. Slender Rush

Very common in paths, along roadsides, fields, low meadows and open woodlands in all kinds of soil. Var. **anthelatus** Wiegand, in open places on the conglomerate soil along the higher ridges. Var. **Williamsii** Fernald, is also frequent.

Juncus articulatus L. Jointed Rush

In wet soil. Infrequent in the valleys of the park area. More abundant in the Allegheny valley and on the glaciated region northward.

Juncus canadensis J. Gay. Canada Rush

Wet marshy places around swamps and ponds of the glaciated region and occasional in the Allegheny valley, and along Quaker run.

Juncus acuminatus Michx. Sharp-fruited Rush

Frequent in moist or wet soil along streams and marshes.

Luzula saltuensis Fernald, *L. Carolinae* S. Wats. Hairy Wood Rush

On moist or rather dry wooded banks and open places. Frequent, especially on the poorer soils of the higher elevations in the park.

Luzula campestris (L.) DC., var. **multiflora** (Ehrh.) Celak. Wood Rush

Dry, open woodlands, banks and meadows, especially in hard or rather poor soils. Common.

LILIACEAE (Lily Family)

Chamaelirium luteum (L.) A. Gray. Devil's Bit

Damp or dry, sandy or gravelly, acid or sterile soils in open places of thin oak and chestnut growth. Rare. Huckleberry hill, banks opposite Red House, Gardener's rocks, Carrollton etc.

Veratrum viride Ait. American White, False or Green Hellebore

Low woods and borders of streams and marshes, usually in alluvial soil. Frequent along the lower stream courses and valleys of the region.

Uvularia perfoliata L. Perfoliate Bellwort

Common in rather dry or moist woodlands, chiefly on slopes or sides of ravines.

Uvularia sessilifolia L., *Oakessia sessilifolia* S. Wats. Sessile Bellwort

Common in rather sterile soils of open woodlands and banks.

Allium canadense L. Wild Garlic

In damp soil. Rare. Found along cinder bank at Riverside Junction, north end of Tunungwant valley, and doubtless to be looked for elsewhere.

Allium tricoccum Ait. Wild Leek

Very common in moist, rich humus of open or rather dense forested areas throughout the park, except the poor soils of the conglomerate formation on the higher ridges. In late July, when in full bloom, one of the most conspicuous plants of the park woodlands.

Allium vineale L. Garlic

Fields and meadows. Rare. Tunungwant valley near Limestone.

HEMEROCALLIS FULVA L. Day Lily

Occasional about the sites of former dwellings and rarely spreading to roadsides etc. Not observed within the park boundaries.

Lilium philadelphicum L. (figure 5). Wood Lily

In sandy, gravelly or rocky woodlands, open slopes and benches. Uncommon. Huckleberry hill, slopes of Elko mountain, benches south of Quaker Bridge on the west side of the Allegheny valley, opposite Red House etc.

Lilium canadense L. Meadow Lily, Canada Lily

In rich, moist soil of low meadows along the lower stream courses of the park area and in the Tunungwant and Allegheny valleys. Infrequent.

Lilium superbum L. Turks Cap Lily

Locally common in moist or wet alluvial thickets and open places along the lower portions of Quaker run and especially along the Allegheny river bottomlands.

(Photo by New York State Museum)

Figure 5 Wood Lily, *Lilium philadelphicum*

Erythronium americanum Ker. Yellow Adder's-tongue, Dog's-tooth Violet

Said to be frequent in the alluvial and rich wooded soils of the region, but not observed during this survey (July 15th September 5th). The flowers appear in early spring and the richly mottled leaves usually die before July 1st.

(Photo by Buffalo Society of Natural Sciences)

Figure 6 White Clintonia, *Clintonia umbellulata*

Clintonia borealis (Ait.) Raf. Yellow Clintonia, Dogberry

In moist or damp humus overlying the more fertile soils of the forested areas of the park, sometimes on open sunny banks. Common.

Clintonia umbellulata (Michx.) Morong (figure 6). White Clintonia

In drier, sterile or somewhat acid humus of open woodlands and slopes, locally common, Huckleberry hill, valley near Cold Spring, Carrollton etc.

Smilacina racemosa (L.) Desf. False Solomon's Seal, False Spikenard

In moist rich woodlands and forested areas as well as on banks and open places of poorer soils. Common and generally distributed.

Smilacina stellata (L.) Desf. Star-flowered Solomon's Seal

In moist, alluvial thickets and sandy banks of the Tunungwant and Allegheny valleys. Uncommon.

Maianthemum canadense Desf. False Lily-of-the-valley, Two-leaved False Solomon's Seal

In dry or damp woodlands, banks and open places of various soil conditions. Common in the park area but infrequent in the bottomlands.

Disporum lanuginosum (Michx.) Nichols. Hairy Disporum

In rich, moist humus of the more densely wooded areas of the park region. Common.

Streptopus roseus Michx. Twisted Stalk

In rich, moist humus of the wooded sections of the park. Common. Occasional in the poorer soils.

Polygonatum pubescens (Willd.) Pursh, *P. biflorum* of Gray's Man. ed. 7, in part. Small Solomon's Seal

In rich, moist woodlands and open places. Common and generally distributed.

(Photo by Buffalo Society of Natural Sciences)

Figure 7 Painted Trillium, *Trillium undulatum*

Polygonatum giganteum Dietr., *P. commutatum* of Gray's Man.? Great Solomon's Seal

In rich, alluvial, damp soil along the bottomlands. Rare. Thickets near Cold Spring.

Medeola virginiana L. Indian Cucumber Root.

In moist woodlands and open places often on rather poor soils. Common.

Trillium erectum L. Red or Purple Trillium, Birthroot, Wake Robin. Bethroot

In moist humus of the forested sections, sometimes on banks and in open places, usually in fertile soils. Common.

Trillium grandiflorum (Michx.) Salisb. White Trillium

In moist, rich woodlands, slopes and ravines. Frequent.

Trillium undulatum Willd. (figure 7). Painted Trillium.

In low woods, often in acid humus. Common. Frequent, however, in many portions of the park area where the soil is more fertile.

Smilax herbacea L. Carrion-flower

In wet thickets and along the banks of streams and rivers. Frequent.

Smilax hispida Muhl. Green Brier, Cat Brier

Alluvial thickets along the Allegheny valley, and absent from the park area proper.

DIOSCOREACEAE (Yam Family)

Dioscorea villosa L. Wild Yam-root

Moist, or rather dry, sandy, sterile or gravelly soils, in open places or thickets, along the bottomlands of the Allegheny river near Quaker Bridge and northern end of the Tunungwant valley.

IRIDACEAE (Iris Family)

Iris versicolor L. Blue Flag

In swamps, wet meadows and borders of streams. Common in the lower valleys, absent from the higher portions of the park.

Sisyrinchium gramineum Curtis, *S. graminoides* Bickn. Blue-eyed Grass

In moist, grassy situations either in fertile or rather sterile soil, sometimes in open woodlands. Common.

ORCHIDACEAE (Orchid Family)

Cypripedium parviflorum Salisb., var. **pubescens** (Willd.) Knight. Larger Yellow Lady's Slipper

In moist or rather dry humus of open woodland slopes, usually in rather poor soil. Rare. Peters run, slopes of Elko mountain etc.

Cypripedium reginae Walt., *C. hirsutum* of Gray's Man., ed. 7 (figure 8). Showy Lady's Slipper

In boggy or springy places, usually more or less shaded, very rare, and only a single colony known within the park area. Salamanca (Day, Plants of Buffalo & Vic. 141. 1882).

Cypripedium acaule Ait. (figure 9). Stemless Lady's Slipper, Moccasin Flower

In sterile or acid humus in open woods and thickets. Frequent. Occasional in the more fertile woodlands of the forested slopes.

Orchis spectabilis L. (figure 10). Showy Orchis

In moist, fertile humus of open woodlands and banks. Infrequent.

(Photo by Buffalo Society of Natural Sciences)

Figure 8 Showy Lady's Slipper, *Cypripedium reginae*

Habenaria clavellata (Michx.) Spreng. Small Green Wood Orchis

Native of sphagnum bogs and boggy acid soils. Very rare and known in this region only in the bogs along the edge of the glacial drift near Steamburg, outside of the park area.

(Photo by Edward A. Eames)

Figure 9 Moccasin Flower, *Cypripedium acule*

Habenaria Hookeriana Torrey. Hooker's Orchis

In sterile or gravelly soil of the higher ridges. Very rare. Summit between Stony run and Bay State.

Habenaria orbiculata (Pursh) Torrey. Large Round-leaved Orchis

In moist, rich humus of the forested areas of the park. Frequent and locally abundant.

Habenaria lacera (Michx.) R. Br. Ragged Orchis

In moist, open places, usually in poor soil. Rare and within the park area found thus far only on Seneca mountain.

Habenaria psycodes (L.) Sw. Purple Fringed Orchis

Common in wet meadows, borders of swamps and within the park area especially along streams and brooks.

Habenaria fimbriata (Ait.) R. Br. Large Purple Fringed Orchis

In wet places along streams. Rare. Quaker run etc.

Pogonia ophioglossoides (L.) Ker. Rose Pogonia, Snake-mouth

Acid, sphagnum bogs along the edge of the glacial drift near Steamburg. Not found within the park area or the adjacent Allegheny valley.

Spiranthes gracilis (Bigel.) Hook. Slender Ladies' Tresses

Dry sandy or gravelly banks and thickets in sterile soil, chiefly in the conglomerate sections of the higher ridges. Infrequent. Summit on Stony brook trail, Blacksnake mountain, Elko mountain, Huckleberry hill etc.

Epipactis pubescens (Willd.) A. A. Eaton (figure 11). Rattlesnake Plantain

In rather dry woods, usually under or near hemlocks. Rare. Three Sisters mountain, Willis creek etc.

Corallorrhiza maculata Raf. Large Coralroot

In moist or rather dry humus of the forested areas of the park region. Frequent. More rarely in sterile soil of open places or thickets.

Microstylis unifolia (Michx.) BSP., *Malaxis unifolia* Michx. Adder's Mouth

In dry or moist humus, chiefly in sections of sterile or acid soil, and hence most abundant on or near the conglomerate formation along the higher ridges of the park area, either in open places or thin woods.

Class 2 DICOTYLEDONEAE

Choripetalae

SALICACEAE (Willow Family)

Populus grandidentata Michx. Large-toothed Aspen

In dry or moist, well-drained and fairly fertile or somewhat sterile soils, chiefly on slopes and crests of the ridges. Common.

Populus tremuloides Michx. American Aspen, Trembling Aspen

In sandy, stony or gravelly, sterile or acid soils. Locally common in many portions of the park area.

Salix nigra Marsh. Black Willow

Alluvial bottomlands, stream banks and wet places. Common in the lower valleys. The only willow of the region becoming treelike in size. The species of Salix collected in the Allegany State Park and adjacent region have been determined by Carleton R. Ball of the United States Department of Agriculture.

(Photo by Buffalo Society of Natural Sciences)

Figure 10 Showy Orchis, *Orchis spectabilis*

Salix lucida Muhl. Shining Willow

Frequent or common along most of the brooks, streams and swampy areas of the park and adjacent region.

(Photo by Buffalo Society of Natural Sciences)

Figure 11 Leaves of the Rattlesnake Plantain, *Epipactis pubescens*

Salix pedicellaris Pursh. Bog Willow

A bog species, found in this region only in the "Balsam swamp" in the lower part of Red House valley.

Salix Bebbiana Sarg., *S. rostrata* Richards. Beaked Willow

In springy or wet places, in open situations or in thin woods, chiefly in poor or sterile soil. Common. Occasional in various situations on better soils.

Salix cordata Muhl. Heart-leaved Willow

Frequent or locally common in wet, usually alluvial soil along most of the larger streams of the park area.

Salix sericea Marsh. Silky Willow

Frequent in swampy places, along most of the streams of the park and in wet alluvial soil on the bottomlands of the Allegheny and Tunungwant valleys. Often large but scarcely treelike.

Salix discolor Muhl. Pussy Willow, Glaucous Willow

Frequent or common in wet places along the streams, the bottomlands of the larger valleys and in and about swamps and marshes.

Salix humilis Marsh. Prairie Willow

In sterile or acid soil of open woods, thickets and banks. Locally abundant. Slopes east of Cold Spring, Huckleberry hill, Elko mountain, upper Stoddard brook, and on the conglomerate soil of many of the higher ridges.

Salix tristis Ait. Dwarf Gray Willow, Sage Willow

In sterile or dry sandy or gravelly soil. Infrequent. Huckleberry hill, upper Quaker run etc.

MYRICACEAE (Sweet Gale Family)

Myrica asplenifolia L. *Comptonia peregrina* (L.) Coulter. Sweet Fern

In sterile, rocky, sandy or gravelly soil. Locally common. Banks on the road toward Elko, Elko mountain, Huckleberry hill, Parker hill etc.

JUGLANDACEAE (Walnut Family)

Juglans cinerea L. Butternut

In fertile lowland soils. Infrequent. Elko, Cold Spring, Tunungwant valley, Quaker run, Red House valley etc.

Carya cordiformis (Wang) K. Koch. Bitternut

In moist, usually fertile soil. Infrequent. Quaker Bridge and elsewhere in the Allegheny and Tunungwant valleys.

Carya glabra (Mill.) Sweet. Pignut

In moist soil along streams and bottomlands. Infrequent in the lower valleys. Quaker Bridge.

Carya ovata (Mill.) K. Koch. Shagbark Hickory

In moist or dry, usually fertile soil. Occasional on the lower forested slopes of the park area but most abundant in the Tunungwant valley and the Allegheny valley between Salamanca and Olean.

BETULACEAE (Birch Family)

Corylus americana Walt. Hazelnut

Frequent in thickets of the larger stream valleys and on the bottomlands of the Allegheny river.

Corylus cornuta Marsh. *C. rostrata* Ait. Beaked Hazelnut

Locally common in poor or sterile soil along the larger valleys. Huckleberry hill, Cold Spring, Carrollton etc.

Ostrya virginiana (Mill.) K. Koch. Hop. Hornbeam, Ironwood

On well-drained slopes in poor or somewhat fertile soil. Infrequent and scattered throughout the park area chiefly on the lower slopes, but found also along the lower valleys.

Carpinus caroliniana Walt. Hornbeam, Blue or Water Beech

Moist or dry, usually alluvial soil, but sometimes on open wooded slopes. Infrequent. Quaker Bridge, slopes of Elko mountain and elsewhere.

Betula lenta L. Black or Sweet Birch

Frequent or common on most of the wooded slopes of the park region.

Betula lutea Michx. f. Yellow Birch

In rich or moist soil and rocky locations. Less frequent than the preceding species.

Alnus incana (L.) Moench. Speckled Alder

In swamps and wet soil along the lower stream courses of the park area and the bottomlands of the Allegheny and Tunungwant valleys.

FAGACEAE (Beech Family)

Fagus grandifolia Ehrh. Beech

A common and characteristic forest tree of most sections of the park, preferring fertile soils, but found occasionally in sandy or sterile soils.

Castanea dentata (Marsh.) Borkh. Chestnut

Frequent on thin or sterile, sometimes rocky soils on some of the higher ridges and also on the slopes adjacent to the Allegheny river, Huckleberry hill, Elko mountain, Pine hill, Seneca mountain, Rattlesnake mountain, summit on the Stony brook trail etc.

In most places the trees are badly diseased by the Chestnut blight disease, *Diaporthe parasitica* Murrill, and while sprouting abundantly from the trunks it seems but a question of a few years when the chestnut will be exterminated in this region by this disease.

Quercus alba L. . White Oak

A frequent forest tree on most of the lower slopes and the drier portions of the bottomlands throughout the region; occasional on the higher ridges. On Huckleberry hill is found the var. **latiloba** Sarg.

Quercus montana Willd., *Q. Prinus* of Gray's Man. ed. 7. See Rhodora 17: 40. 1915. Chestnut Oak

In dry, sterile, chiefly rocky soil. Infrequent. Bluffs along the Allegheny river toward Elko etc.

Quercus bicolor Willd. Swamp White Oak

In low or wet, chiefly alluvial soil and swampy situations in the lower Tunungwant valley, Butler run, and the Allegheny valley.

Quercus rubra L. *Q. borealis* Michx. f. var. *maxima* (Marsh.) Sarg. Rhodora 18: 48. 1916. Red Oak

A common forest tree in most sections of the park area, with little reference to soil fertility, but generally absent where it is very wet or swampy.

Quercus velutina Lam. Black Oak, Dyer's Oak, Quercitron

In dry, rocky, stony or gravelly, sterile or acid soils. Locally frequent. Occasional on the conglomerate soils of the higher ridges, common on Huckleberry hill, Jones hill, Elko mountain, benches opposite Red House, Peters run, Carrollton etc.

URTICACEAE (Nettle Family)

Ulmus americana L. American Elm

On alluvial bottomlands of the lower streams and larger river valleys, where common. Less abundant in moist soil of some of the lower wooded slopes.

Ulmus fulva Michx. Slippery Elm

Bluffs and banks along the larger streams. Uncommon. Quaker Bridge and perhaps elsewhere.

Humulus Lupulus L. Hop

Alluvial thickets and swamps along the bottomlands of the Allegheny and Tunungwant valleys, where undoubtedly native.

Laportea canadensis (L.) Gaud., *Urticastrum divaricatum* (L.) Kuntze. Wood Nettle

In moist alluvial soil of thickets and open woods chiefly along the lower stream valleys, but frequent in wet places on many of the slopes and higher portions of the park.

Urtica gracilis Ait. Common Nettle

In wet alluvial soil in open or partially shaded situations chiefly along the Allegheny and Tunungwant valleys; occasionally elsewhere.

Pilea pumila (L.) Gray. Richweed, Clearweed

On moist or wet, rocky, usually shaded slopes and ravines. Frequent. Sometimes in wet or springy places in the forested areas.

Boehmeria cylindrica (L.) Sw. False Nettle

In wet or marshy places, in open or partially shaded situations, but most abundant on the bottomlands and the lower stream courses.

SANTALACEAE (Sandalwood Family)

Comandra umbellata (L.) Nutt. Comandra, Bastard Toadflax

Dry, sandy or sterile banks and thickets, sometimes in open woods, on the bottomlands of the Allegheny river along the road toward Steamburg, benches opposite Red House etc.

ARISTOLOCHIACEAE (Birthwort Family)

Asarum canadense L. Wild Ginger, Canada Snakeroot

In moist, rich humus of the wooded slopes and banks. Locally abundant in certain portions of the park.

Asarum reflexum Bicknell, *A. canadense* var. *reflexum* Robinson

In moist rich humus on wooded slopes along Quaker run and elsewhere.

POLYGONACEAE (Buckwheat Family)

RUMEX CRISPUS L. Yellow or Curly Dock

A weed in cultivated and waste ground, roadsides and banks. Infrequent or rare, except near Salamanca.

Rumex verticillatus L. Swamp Dock

In shallow water or wet soil in marshes and swales along the Allegheny and Tunungwant valleys. Frequent. Not found in the higher portions of the park.

Rumex Britannica L.

Reported by Saunders (Roosevelt Wild Life Bul., 1: 311. 1923) from the Tunungwant valley swamps. Not seen in the progress of this survey.

RUMEX OBTUSIFOLIUS L. Bitter or Broad-leaved Dock

A common weed in fields, meadows, along roadsides and neglected ground.

RUMEX ACETOSELLA L. Sheep Sorrel, Field Sorrel

A common weed in poor or sterile, often sandy or gravelly soil.

FAGOPYRUM ESCULENTUM Moench. Buckwheat

Occasional in fields after cultivation and rarely along railroads, but seemingly not established.

POLYGONUM AVICULARE L. Knotweed

A common weed of yards, roadsides, neglected ground and along railroads. The var. ANGUSTISSIMUM Meissn., *P. neglectum* Besser, in cinders along the railroad near Quaker Bridge.

POLYGONUM ERECTUM L. Erect Knotweed

Infrequent as a weed in waste ground.

Polygonum lapathifolium L. Pale Smartweed

Common in moist or wet situations in the lower and larger valleys, weedlike in nature and perhaps in large part introduced.

Polygonum scabrum Moench, *P. tomentosum* of Gray's Man., not Schrank

Occasional in wet places in the lower valleys. Pine run etc.

Polygonum pennsylvanicum L.

Common in moist or wet soil of the bottomlands and along streams and springy places elsewhere.

POLYONUM HYDROPIPER L. Smartweed, Water Pepper

Common in wet places in the principal valleys of the park, moist or wet roadsides, exsiccated depressions, swales and marshes.

Polygonum hydropiperoides Michx.

In marshy places in the Tunungwant valley and elsewhere. Uncommon.

POLYGONUM PERSICARIA L. Lady's Thumb, Heartweed

A frequent or common weed of roadsides, waste ground, cultivated fields and banks.

Polygonum coccineum Muhl., *P. Muhlenbergii* in Gray's Man. Water Smartweed

In shallow water and wet places along the Allegheny river and the Tunungwant creek. Infrequent.

Polygonum virginianum L. Virginia Knotweed

In rich alluvial woods and thickets along the larger streams of the park and adjacent valleys. Common.

Polygonum sagittatum L. Arrow-leaved Tearthumb

In wet or moist openings and thickets, chiefly along streams and rivers. Common.

Polygonum arifolium L. Halberd-leaved Tearthumb

In wet or mossy swamps and bogs. Rare. "Balsam swamp" in Red House valley; bogs and swamps along the edge of the glacial drift near Steamburg and Randolph.

POLYGONUM CONVOLVULUS L. Black Bindweed

A weed in waste places along the cinder banks of the railroad north of Quaker Bridge and doubtlessly elsewhere.

Polygonum scandens L. Climbing False Buckwheat

Moist or dry thickets on sandy or rocky banks. Infrequent. Holts run, Elko etc.

Polygonum cilinode Michx. Fringed Black Bindweed

In dry or sterile, sandy or acid soil. Frequent. Conglomerate soils in open places on many of the higher ridges, Bradford road near state line, Quaker Run valley, bluffs along the eastern side of the Allegheny valley toward Elko and elsewhere.

CHENOPODIACEAE (Goosefoot Family)

CHENOPODIUM ALBUM L. Lamb's Quarters, Pigweed

A common weed in fertile soil. Quaker run, Quaker Bridge, Pine hill, Breed's run, Salamanca etc.

CHENOPODIUM BERLANDERI Moq.

Along the Erie Railroad near Quaker Bridge.

CHENOPODIUM LEPTOPHYLLUM Nutt.

Along the Erie Railroad near Quaker Bridge. This and the preceding species adventive from the west.

ATRIPLEX PATULA L. Atriplex

Waste places and cultivated soil, rare in the Allegheny valley. The var. HASTATA (L.) Gray, about oil wells in the Tunungwant valley near Limestone, growing where most of the other vegetation has been killed by oily waste.

AMARANTHACEAE (Amaranth Family)

AMARANTHUS RETROFLEXUS L. Green Amaranth, Amaranth Pigweed

A frequent or common weed in fertile soil of cultivated and waste ground, roadsides and fields, but rarely seen in the wooded areas of the park.

PHYTOLACCACEAE (Pokeweed Family)

Phytolacca americana L., *P. decandra* Gray's Man. Pokeweed, Scoke, Pigeon Berry

In moist or wet soil of the openings in the woods in the higher portions of the park area. Not seen on the bottomlands. Infrequent or local.

AIZOACEAE (Carpet-weed Family)

MOLLUGO VERTICILLATA L. Carpet Weed

A weed of rather dry cultivated soil, infrequent. Quaker Bridge, Salamanca, Limestone and elsewhere.

CARYOPHYLLACEAE (Pink Family)

SPERGULA ARVENSIS L. Corn Spurry

An infrequent weed in cultivated and waste ground, usually in sandy or gravelly soil, Irish run, Jones hill.

Arenaria lateriflora L. Sandwort

In mossy acid bogs and wooded swamps and in thickets or open woods on sandy or gravelly slopes, locally abundant. "Balsam swamp" in Red House valley, slopes near Cold Spring, Elko mountain and elsewhere.

STELLARIA AQUATICA (L.) Scop. Water Chickweed

In wet soil of waste places and low meadows. Rare. Tunungwant valley near Limestone.

STELLARIA GRAMINEA L. Common Starwort

In moist or wet, usually grassy meadows and fields and open places. Frequent. Elko, Stony brook trail, Quaker run valley etc.

STELLARIA MEDIA (L.) Cyrill. Common Chickweed

A common weed of cultivated ground and waste places, often along woodland roads.

Stellaria uliginosa Murr. Bog Starwort

Along the mossy borders of cold brooks and in cold mossy springy spots on open slopes or thin woods. Infrequent but widely distributed in the higher portions of the park. Headwaters of Red House creek, springs above Limestone run, Bradford road near state line, Cold Spring etc.

CERASTIUM VULGATUM L. Mouse-ear Chickweed

A common weed of cultivated soil, roadsides and waste places which has spread into the forested areas of the park.

AGROSTEMMA GITHAGO L. Corn Cockle

A weed of cultivated fields, usually with grain, sometimes in waste places or along roadsides. Infrequent and found chiefly in the Allegheny and Tunungwant valleys.

LYCHNIS ALBA Mill. White Campion

A weed along the Erie Railroad north of Quaker Bridge, and doubtlessly to be looked for elsewhere.

SAPONARIA OFFICINALIS L. Bouncing Bet, Soapwort

A weed along cinder railroad banks and elsewhere. Very common along the Erie Railroad in the Allegheny valley.

SILENE ANTIRRHINA L. Sleepy Catchfly

A weed along cinder railroad banks in the Allegheny valley. Infrequent.

SILENE NOCTIFLORA L. Night-flowering Catchfly

In waste or cultivated, usually dry soil. Rare. Old mill site near Frecks (Frank W. Johnson).

Silene stellata (L.) Ait. f. Starry Campion

Dry thickets or open woods on sandy or gravelly, sterile soil. Infrequent. Not found in the higher portions of the park. Banks and benches of the Allegheny bottomlands opposite Red House, south of Quaker Bridge, on Butler run etc.

PORTULACACEAE (Purslane Family)

Claytonia caroliniana Michx. (figure 12). Broad-leaved Spring Beauty

In damp or moist, fertile humus of rather open woodlands, thickets and sometimes on banks in open places. Common in spring, but by late summer hard to find.

NYMPHAEACEAE (Water Lily Family)

Nymphaea advena Ait. Cow Lily, Spatterdock, Yellow Pond Lily

In pools, ponds and marshy places. Rare. Tunungwant valley near the Allegheny river.

Castalia odorata (Ait.) Woodville & Wood. White Water Lily

In ponds and marshes. Rare. Not seen within the park area but found in a marshy pond on Pine hill near Randolph.

Brasenia Schreberi Gmel. Water Shield

In ponds and lakes. Very rare. Red pond near Steamburg, outside of the park area.

RANUNCULACEAE (Crowfoot Family)

Aquilegia canadensis L. Wild Columbine

In open woods, dry slopes and banks, usually in poor or sterile, sandy, rocky or gravelly soil. Frequent. Woods near Quaker Bridge, Huckleberry hill, Elko mountain, Blacksnake mountain etc.

Coptis trifolia (L.) Salisb. (figure 13). Goldthread

In moist woods and banks, often under hemlocks and in mossy swamps. Frequent.

(Photo by Buffalo Society of Natural Sciences)

Figure 12 Spring Beauty, *Claytonia caroliniana.*

(Photo by New York State Museum)

Figure 13 Goldthread, *Coptis trifolia*

Caltha palustris L. Marsh Marigold, Cowslip

In and along the borders of marshes and open swamps. Rare. Tunungwant valley. Bogs and marshes near Steamburg and Randolph along the edge of the glacial drift.

Ranunculus abortivus L. Small-flowered Buttercup

In open woods, along streams and in moist or wet thickets. Common. The var. **eucyclus** Fernald. Frequent.

Ranunculus recurvatus Poir. Hooked Buttercup

In moist woodlands, ravines, and moist or wet soils. Common.

Ranunculus pennsylvanicus L. f. Bristly Buttercup

In alluvial or sandy, often wet soil of thickets and open places. Rare along the Allegheny river.

Ranunculus septentrionalis Poir. Swamp Buttercup

In marshy places chiefly along the bottomlands. Infrequent. Near Quaker Bridge, Stony run trail.

Ranunculus laxicaulis (T. & G.) Darby. Water Plantain, Spearwort

Saunders (Roosevelt Wild Life Bul. 1:310. 1923) mentions as a plant of the Tunungwant valley, and Clinton has reported it from Salamanca.

Ranunculus acris L. Tall Field Buttercup

A common weed in fields and waste places, which has spread into nearly all sections of the park area.

Thalicturm dioicum L. Early Meadow Rue

In dry, or sometimes moist, rocky or gravelly soil of ravine banks and mountain slopes. Common.

Thalicturm polygamum Muhl. Meadow Rue

In moist or wet soil, either gravelly or alluvial along streams and bottomlands, sometimes in swamps and marshy meadows. Common.

Anemone virginiana L. Tall Anemone

In moist or dry, gravelly or alluvial soil along streams and lowlands as well as open places of the forested areas throughout the park. Common. Var. **alba** Wood. Frequent.

Anemone canadensis L. Canada Anemone

In marshy places along the bottomlands of the Allegheny river and on adjacent sandy or gravelly banks. Infrequent.

Anemone quinquefolia L. Wood Anemone

Sandy or rocky woodlands and thickets, either dry or somewhat moist, chiefly along the lower stream valleys and the bottomlands of the Allegheny and Tunungwant. Also in woods and thickets on the conglomerate soils of the higher ridges.

Actaea alba (L.) Mill. White Baneberry

In moist, fertile woodlands, on banks and slopes. Frequent or common.

Hepatica americana (DC.) Ker., *H. triloba* Gray's Man. Blunt-lobed Hepatica or Liverleaf

In gravelly, sandy or stony, rather sterile soil of dry open woodlands and slopes. Infrequent. Elko mountain, Huckleberry hill etc.

Hepatica acutiloba DC. Sharp-lobed Hepatica or Liverleaf

In moist or dry open woodlands and on banks in fertile or loamy soil. Common.

Cimicifuga racemosa (L.) Nutt. Black Snakeroot, Black Cohosh

In open woods, thickets and thinly wooded slopes in moist fertile or rather sterile rocky or gravelly soil. Particularly abundant on Elko mountain and Parker hill, but frequent throughout the park area.

Clematis virginiana L. Virgin's Bower, White Clematis

In moist or wet soil of thickets and open places along streams and bottomlands. Common.

MAGNOLIACEAE (Magnolia Family)

Magnolia acuminata L. Cucumber Tree

In rich, loamy soil of mountain slopes. Common. Rarely seen on the sterile conglomerate soils of the higher ridges and rare on the Allegheny river bottomlands.

Liriodendron Tulipifera L. Tulip Tree, Whitewood, Yellow Poplar

In moist soil, either loamy or stony and somewhat sterile. Infrequent, but probably formerly more abundant. Slopes of Elko mountain. Young specimens are frequent in many portions of the park, indicating a gradual return of this tree to a position of importance in the forest.

MENISPERMACEAE (Moonseed Family)

Menispermum canadense L. Moonseed

In moist or alluvial thickets and woodland borders. Rare. Thickets near Cold Spring, Elko etc.

BERBERIDACEAE (Barberry Family)

Podophyllum peltatum L. May Apple, Mandrake

Usually in moist, loamy soils in open places and thin woods. Common.

Caulophyllum thalictroides (L.) Michx. Blue Cohosh

In moist, fertile soil of the forested areas, sometimes in open places. Common.

LAURACEAE (Laurel Family)

Sassafras officinale Nees & Eb., *S. variifolium* Gray's Man. Sassafras

In sandy, rocky or gravelly sterile soil of thinly wooded banks, slopes and ridges. In the park area common only on the conglomerate soils of the higher ridges, the rocky banks and slopes of Elko mountain, Huckleberry hill and similar situations, as well as on the sandy and gravelly benches of the Allegheny valley.

Benzoin aestivale (L.) Nees. Spice Bush

In swamps, thickets, marshes and bogs. Rare. Tunungwant valley, "Balsam swamp" in Red House valley, Pine hill, bogs near Steamburg etc.

PAPAVERACEAE (Poppy Family)

Sanguinaria canadensis L. Bloodroot

Moist alluvial woodlands, thickets and banks. Rare. River bottomlands near Red House.

FUMARIACEAE (Fumitory Family)

Dicentra Cucullaria (L.) Bernh. Dutchman's Breeches

Moist, loamy soil of fertile woodlands and alluvial bottomlands. Frequent in spring but disappears by midsummer.

Dicentra canadensis (Goldie) Walp. Squirrel Corn

In situations similar to the preceding species, and more abundant in alluvial soils, frequent or locally common but like the preceding species, the leaves have disappeared by midsummer.

Corydalis sempervirens (L.) Pers. Pink or Pale Corydalis

In sterile or rocky soil of the higher ridges of the park region on the conglomerate formation. Rare. Ridge above Peters run. Often appears where fires have occurred.

CRUCIFERAE (Mustard Family)

LEPIDIUM DENSIFLORUM Schrad., *L. apetalum* Gray's Man. Peppergrass

In cinders along the Erie Railroad in the Allegheny valley and doubtlessly elsewhere.

LEPIDIUM CAMPESTRE (L.) R. Br. Downy Peppergrass

With the preceding species, and also spreading to adjacent banks.

CAPSELLA BURSA-PASTORIS (L.) Medic. Shepherd's Purse

A very common weed in cultivated and waste soil.

BRASSICA NIGRA (L.) Koch. Black Mustard

A weed in fields and waste places. Infrequent.

BRASSICA ARVENSIS (L.) Kuntze. Charlock, Wild Mustard, Summer Mustard

A weed in cultivated fields and waste places. Frequent.

BRASSICA RAPA L. Turnip

An occasional escape in waste places. Red House.

SISYMBRIUM OFFICINALE (L.) Scop. Hedge Mustard

A weed of waste places and neglected yards. Infrequent. Salamanca etc.

SISYMBRIUM ALTISSIMUM L. Tumble Mustard

A rare weed along railroads and in waste soil in the region adjacent to the park area.

Roripa palustris (L.) Bess., *Radicula palustris,* Gray's Man. Marsh Cress

In wet or marshy, usually alluvial soil, along the lower stream courses and bottomlands of the Allegheny and Tunungwant valleys. Infrequent.

NASTURTIUM NASTURTIUM-AQUATICUM (L.) Karst., *Radicula Nasturtium-aquatica.* Water Cress

In quiet waters and brooks. Rare. Stetson pond near Randolph.

ARMORACIA RUSTICANA Gaertn., *Radicula Armoracia,* Gray's Man. Horse-radish

In rich soil. Occasional in cultivation and rarely established in low grounds of the Allegheny valley.

BARBAREA VULGARIS R. Br. Winter Cress, Yellow Rocket, Spring Mustard

In moist cultivated soil, roadsides and fields, occasional in the park area and more abundant in the surrounding valleys.

Dentaria diphylla Michx. Crinkleroot, Toothwort, Pepperroot

Rich woodlands and ravines in moist humus, or in alluvial soil along streams. Frequent.

Dentaria laciniata Muhl. Toothwort, Crinkleroot

Moist rich woodlands and ravines, and less frequent on the alluvial bottomlands. Common.

Cardamine bulbosa (Schreb.) BSP. Spring Cress

In wet or moist alluvial soil of woodlands and thickets in the Allegheny valley. Rare.

Cardamine pennsylvanica Muhl. Woodland Cress

In moist or wet places along streams and springy or wet places in open woodlands. Common.

Cardamine rotundifolia Michx. Round-leaved Cress

In cold, mossy springy places. Rare. Slopes near Cold Spring, "Balsam swamp" in Red House valley, Carrollton etc.

SARRACENIACEAE (Pitcher Plant Family)

Sarracenia purpurea L. Pitcher Plant, Sidesaddle Flower

In acid sphagnous bogs along the edge of the glacial drift near Steamburg, Randolph etc., and outside of the park area.

DROSERACEAE (Sundew Family)

Drosera rotundifolia L. Round-leaved Sundew

In sphagnous bogs with the preceding species.

CRASSULACEAE (Orpine Family)

Penthorum sedoides L. Ditch Stonecrop

In moist soil of open places along the lower valleys. Infrequent. Along Red House creek, Tunungwant valley etc.

SEDUM TRIPHYLLUM (Haw.) S. F. Gray, *S. purpureum*, Gray's Man. See Rhodora 11:46. 1909. Live-forever

A rare weed along roadsides, on banks and neglected yards. Holt run.

SAXIFRAGACEAE (Saxifrage Family)

Saxifraga pennsylvanica L. Swamp Saxifrage

In wet gravelly soil along many of the streams of the park area. Common.

Tiarella cordifolia L. False Miterwort

In moist or dry humus of woodlands, ravines and banks. Common.

Mitella diphylla L. Miterwort, Bishop's Cap

In moist or rather wet humus of woodlands, ravines and open slopes. Common.

Chrysosplenium americanum Schw. Golden Saxifrage

In cold springs and wet places along brooks and streams throughout the park area. Frequent.

Ribes Cynosbati L. Prickly Gooseberry

A shrub of dry open thickets and moist, gravelly or stony places along streams. Frequent.

Ribes americanum Mil., *R. floridum*, Gray's Man. Wild Black Currant

A shrub of low wet woods, marshes and swamps chiefly in the bottomlands. Infrequent. Woods and marshes near Quaker Bridge, Elko etc.

Ribes lacustre (Pers.) Poir. Swamp Black Currant

Moist rocks in open woods above the north side of Quaker run, and doubtless in swampy places elsewhere.

Ribes prostratum L'Her., *R. glandulosum* Grauer. Skunk or Fetid Currant

In low wet or marshy woods, swamps and rocky places. Frequent. Rocks above north side of Quaker run, low woods near Quaker Bridge and elsewhere.

Ribes triste Pall. var. **albinervium** (Michx.) Fernald. Wild Red Currant

In wet or boggy woods. Rare. Along Tunungwant creek near its north end.

HAMAMELIDACEAE (Witch-hazel Family)

Hamamelis virginiana L. Witch-hazel

A frequent shrub of dry or moist woods, banks and ravines, often in rather poor or sterile soil.

PLATANACEAE (Plane Tree Family)

Platanus occidentalis L. Sycamore, Buttonwood

A frequent tree along the alluvial banks of the Allegheny river.

ROSACEAE (Rose Family)

Spiraea alba DuRoi, *S. salicifolia,* Gray's Man. Meadowsweet

Marshy or wet open places. Very rare. Upper Quaker run.

Filipendula rubra (Hill) Robinson. Queen of the Prairie

In fields, yards and thickets of the Allegheny valley, rare. Near Quaker Bridge apparently native, but also appearing as a relic of cultivation about the sites of former dwellings.

FILIPENDULA ULMARIA (L.) Maxim. Queen of the Meadow

About the sites of former dwellings on the Allegheny bottomlands, a relic of cultivation.

Gillenia trifoliata (L.) Moench. Bowman's Root, False Ipecac, Indian Physic

In sandy, gravelly or stony soil, usually somewhat sterile, on open banks or in thin oak woods chiefly in the Allegheny valley. Infrequent. Tunasassa, Peters run, along the road from Quaker Bridge toward Steamburg etc.

PYRUS COMMUNIS L. Pear

Frequent in cultivation but self-sown trees are rarely found.

MALUS PUMILA Mill., *Pyrus Malus.* L., *Malus Malus* (L.) Britt. Common Apple

Common in cultivation. Self-seeded wild trees are occasionally found.

Malus coronaria (L.) Mill. Wild Crab-apple

Moist or dry thickets and alluvial soil, chiefly in the Allegheny and Tunungwant valleys. Infrequent. The var. **elongata** Rehder, is reported from Cattaraugus county by Sargent (Manual, ed. 2, p. 385, 1922). Trees near Riverside at north end of Tunungwant valley show leaves of the typical species and leaves as described for the variety on the same tree.

Malus glaucescens Rehder. Wild Crab-apple

Alluvial thickets and river banks along the Allegheny river near Quaker Bridge and Cold Spring.

Sorbus americana Marsh., *Pyrus americana* DC. Mountain Ash

In moist gravelly, stony or rocky situations. Infrequent. Bradford road near state line. Common among the gigantic rocks of the "Rock City," four miles north of Salamanca. Occasional elsewhere on the higher ridges of the park area, and frequent in the low swampy woods of the Allegheny bottomlands.

Aronia melanocarpa (Michx.) Britton, *Pyrus melanocarpa* Willd. Black Chokeberry

In bogs, swamps and marshes, usually but apparently not always in acid soil. Locally common on the bottomlands of the Allegheny river from Onoville to Cold Spring, bogs on the edge of the glacial drift near Randolph and Steamburg, "Balsam swamp" in Red House valley etc.

Amelanchier intermedia Spach. Shadbush. See Rhodora 14:117. 1912, for Wiegand's revision of Amelanchier.

In dry or moist, sterile soil along the upper ridges and similar situations on the lowlands. Frequent.

Amelanchier canadensis (L.) Medic. Shadbush

In similar situations as the preceding species, but often in drier and more sterile soil. Frequent. Occasional in richer soil of open woodlands throughout the region.

Amelanchier laevis Wiegand. Shadbush, June Berry, Service Berry

Moist or rather dry open woodlands and thickets throughout the park area, but preferring poor soils.

Crataegus punctata Jacq. Thorn Apple

Fields, thickets and slopes of the lower and larger valleys, common. The species of Crataegus are listed according to the treatment by Eggleston in N. Y. State Museum Bulletin 254: 414–30. 1924. The common name "Thorn Apple" applies almost equally well to all of them. Saunders (Roosevelt Wild Life Bul. 1:277. 1927) reports **Crataegus Crus-galli** from the park area.

Crataegus Boyntoni Beadle.

Dry, rocky or gravelly slopes and open woods. Frequent.

Crataegus macrosperma Ashe.

Fields, thickets and hedgerows, usually in clayey or dry soil. Infrequent.

Crataegus pruinosa (Wendl.) K. Koch.

Open woods, fields and thickets in moist soil. Frequent. Also the varieties **conjuncta** (Sarg.) Eggleston, and **dissona** (Sarg.) Eggleston.

Crataegus beata Sargent.

Thickets and open woods, sometimes in fields, in poor or sterile soil. Frequent in the upland portions of the park, and occasional on the slopes adjacent to the lower valleys, chiefly the variety **compta** (Sarg.) Eggleston.

Crataegus Holmesiana Sargent.

In poor, gravelly or sandy soil of the bottomlands. Rare. Near Salamanca etc.

Crataegus coccinoides Ashe, var. **dilatata** (Sarg.) Eggleston.

In fields and thickets near Salamanca

Crataegus coccinea L. Scarlet Thorn

In fields, thickets and hedgerows, usually in dry, heavy or clayey soil. Common. Occasional in soil somewhat alluvial in nature. Var. **Ellwangeriana** (Sarg.) Eggleston, near Salamanca.

Crataegus Brainerdi Sarg., var. Egglestoni (Sarg.) Robins.

Dry, gravelly or stony soil near Salamanca. Rare.

Crataegus succulenta Schrader.

In fields, pastures and thickets, in various kinds of soil. Frequent.

Crataegus Calpodendron (Ehrh.) Medic.

In clay or gravelly soil chiefly along the slopes adjacent to or in the Allegheny valley. Frequent.

Fragaria virginica Duchesne. Field Strawberry

In fields, meadows and open woods, usually in rather poor soil. Common especially in the Allegheny valley.

Fragaria vesca L. var. **americana** Porter. Woodland Strawberry

In open, rocky, usually grassy woods. Rare. Pine hill. A form with white fruit is common also on Pine hill.

Waldsteinia fragarioides (Michx.) Tratt. Barren Strawberry

In dry, or sometimes moist woodlands and on banks, common especially in the higher portions of

the park area where the soils are inclined to be sterile, but occasional in rich humus of the lower slopes and ravines.

POTENTILLA RECTA L. Rough-fruited Cinquefoil

Roadsides and dry fields. Rare.

Potentilla monspeliensis L., *P. norvegica* L. var. *hirsuta* (Michx.) Lehm., See Wiegand & Eames, Flora of the Cayuga Lake Basin, p. 269. 1926. Hairy Cinquefoil

Roadsides, waste places and open grassy places of the forest and the upland ridges. Common.

Potentilla canadensis L. Common Cinquefoil, Five-finger

Dry open woods, fields and thickets. Common.

Geum canadense Jacq. White Avens

In moist thickets and on shaded banks. Common along streams and frequent in open woodlands.

Geum virginianum L. Bristly White Avens

In situations similar to the preceding species but much less common. Along Quaker run, Three Sister's mountain etc.

Geum strictum Ait. Yellow Avens

Moist fields, thickets and open woods, usually in fertile and often alluvial soil. Common except on the higher slopes and ridges.

Geum rivale L. Water or Purple Avens

In springy or boggy places, locally abundant. Bogs and swamps near Steamburg and Randolph, "Balsam swamp" in Red House valley, mossy springy places in the clearing on the Stony run trail etc.

Rubus hispidus L. Hispid or Running Swamp Blackberry

In acid, mossy swamps or boggy places. Infrequent. Upper part of Quaker run, clearing on Stony brook trail, "Balsam swamp" in Red House valley etc.

Rubus flagellaris Willd., *R. procumbens* Muhl., *R. villosus* Gray's Man. Dewberry

In sterile or acid, usually dry, sandy or gravelly soil. Occasional on the benches of the Allegheny valley.

Rubus pergratus Blanchard. Blackberry

In dry thickets and open woods. Infrequent. Woods along Quaker run, near Quaker Bridge etc.

Rubus allegheniensis Porter. High or Common Blackberry

On dry or moist banks, in open woods and thickets and recent clearings or openings of the forest. Common especially above the bottomlands of the lower valleys.

Rubus pubescens Raf., *R. triflorus* Gray's Man. Dwarf Red Blackberry

On and about moist shaded rocks, and in swamps and boggy woods. Frequent. Rocks above north side Quaker run, Mount Onondaga, "Rock City" north of Salamanca, "Balsam swamp" in Red House valley, clearing on the Stony brook trail etc.

Rubus strigosus Michx., *R. idaeus* var. *aculeatissimus,* Gray's Man. Red Raspberry

In moist or dry soil of forest openings, borders, thickets and swampy woods. Common.

Rubus odoratus L. Thimbleberry, Flowering Raspberry

In moist rocky woods, thickets and on gravelly banks. Frequent. Elko mountain, Blacksnake mountain etc.

Rubus occidentalis L. Black Raspberry

On dry banks, thickets and woodland borders. Infrequent. Road near Elko etc.

Dalibarda repens L. False Violet, Dalibarda

In moist fertile humus of forested areas and low woodlands. Common.

Agrimonia gryposepala Wallr. Agrimony

Dry thickets, open woods, and banks both in fertile and sterile soils. Common.

Agrimonia striata Michx. Britton's Agrimony

Dry soil of thickets and open woods. Rare. Quaker run (Frank W. Johnson.)

Rosa obovata Raf.

Wet soil near Quaker Bridge. Rare. Specimens of wild roses collected in the Allegany Park and adjacent territory have been named by Eileen W. Erlanson.

Rosa carolina L. Dwarf Wild Rose

In sterile, sandy, gravelly or rocky soil, chiefly in the lower and larger valleys. Common. Occasional on some of the higher ridges. Sandy thickets of the bench opposite Red House, banks near Cold Spring, along road from Onoville Station to Limestone cove, dry banks near Carrollton etc.

Var. **glandulosa** Farwell (*R. serrulata* Raf.), in similar situations but much less common. Summit of Elko mountain, banks along Erie railroad north of Quaker Bridge.

Rosa Bushii Rydb.

Peters run, Alexander, Aug. 10, 1926. Miss Erlanson says of this specimen: "resembles *R. Bushii,* probably differs genotypically, sterility manifestly indicates hybridity."

Rosa palustris Marsh. Marsh Rose

In wet marshes. Infrequent. In this region found only in an open marsh on the south edge of Randolph village, but doubtless to be looked for elsewhere.

Prunus americana Marsh. Wild Plum

In moist or dry alluvial soil along the Allegheny river where it forms in some places, large and particularly dense thickets.

Prunus pennsylvanica L. f. Pin, Pigeon, or Wild Red Cherry

Common in open woods and recent clearings, especially in the poorer soils of the upper portions of the park area, but frequent in more fertile soils of the lower slopes, and even in the swampy woods of the Allegheny valley.

Prunus virginiana L. Choke Cherry

On rocky or gravelly banks and slopes, chiefly abundant along the lower and larger valleys, but occasionally in open places throughout the park.

Prunus serotina Ehrh. Wild Black Cherry

A common forest tree in nearly all sections of the park, but seemingly preferring the fertile slopes. The older trees have been mostly lumbered, but an abundance of young trees indicates that this species will eventually regain its important position in the mature forest.

LEGUMINOSAE (Pulse Family)

Baptisia tinctoria (L.) R. Br. Wild Indigo

In sterile, or acid, sandy or gravelly soil, and hence particularly common and conspicuous, when in bloom, on the sandy and gravelly benches of the Allegheny valley, the bluffs along the road toward Elko, Red House, Breed's run, Carrollton etc.

Lupinus perennis L. Wild Lupine

In dry, sandy, acid or gravelly soil. Very rare. Ridge above Peters run, Elko mountain, Jones hill. The general absence of this species from the extensive sterile and more or less acid sandy and gravelly benches of the Allegheny valley is difficult to explain. Reported from Salamanca by Clinton.

TRIFOLIUM PRATENSE L. Red Clover

Frequent in rich soils and sometimes along roadsides. Generally absent from most of the park area proper.

TRIFOLIUM REPENS L. Creeping White Clover

Roadsides, lawns and waste ground. Rare in the park area but common in the agricultural region surrounding the park.

TRIFOLIUM HYBRIDUM L. Alsike Clover

In situations similar to *T. pratense,* but less frequent.

TRIFOLIUM AGRARIUM L. Yellow or Hop Clover

Fields and roadsides, usually in poor soil. Frequent. Irish run, Quaker Bridge, near Frecks etc.

MEDICAGO SATIVA L. Alfalfa.

Field and roadside near Limestone in the Tunungwant valley. Apparently rare in this region.

MEDICAGO LUPULINA L. Black Medic

In cinders along the Erie Railroad north of Quaker Bridge; occasionally elsewhere as a weed.

ROBINIA PSEUDOACACIA L. Common or Black Locust

Trees, obviously planted, are to be seen in the Allegheny and Tunungwant valleys, but established trees from self-sown seed appear to be absent.

Desmodium nudiflorum (L.) D. C. Tick Trefoil

In dry, sandy or gravelly thickets and open woods. Rare. Butler's run, benches opposite Red House. The various species of *Desmodium* (*Meibomia*) are commonly called Tick Trefoil.

Desmodium grandiflorum (Walt.) DC., *D. acuminatum*

In dry, open woods and thickets. Frequent. Slopes near Cold Spring, Huckleberry hill, Elko mountain etc.

Desmodium rotundifolium (Michx.) DC., *Meibomia Michauxii* Vail.

In dry, sandy, gravelly or rocky soil of open woods, banks and benches. Infrequent. Huckleberry hill, slopes of Elko mountain, benches opposite Red House etc.

Desmodium bracteosum (Michx.) DC.

In rather poor or somewhat fertile, usually hard soil of open woods, banks and thickets. Infrequent. Roadside near Quaker Bridge toward Steamburg, slopes opposite Red House, Butler hill etc.

Desmodium paniculatum (L.) DC.

In moist or dry woodlands and borders. Frequent. Tunassassa, Gardner's rock, Cold Spring, Bradford road etc.

Desmodium canadense (L.) DC.

Moist gravelly and sandy banks of the lower valleys. Frequent. The most conspicuous species of the genus when in bloom.

Lespedeza intermedia (Wats.) Britton, *L. frutescens,* Gray's Man. See N. Y. State Mus. Bulletin 254:450. 1924 & Rhodora 26:29. 1924. Wand-like Bush Clover

In open woods in sandy, gravelly or stony soil. Infrequent. Elko mountain, summit on Stony run trail, Huckleberry hill.

Lespedeza hirta (L.) Hornem. Hairy Bush Clover

In sterile, sandy or gravelly soil of the benches in the Allegheny valley where locally common, near Quaker Bridge, opposite Red House, Carrollton etc.

Lespedeza capitata Michx. Round-headed Bush Clover

In acid, sandy or gravelly soil. Rare. Elko.

Lathyrus ochroleucus Hook. Pale Vetchling

Dry banks, open woods and slopes. Rare. Carrollton (Peck). Butler's run (Alexander).

Vicia Cracca L. Wild Vetch

Fields, roadsides and thickets in poor soil. Rare. Riverflats near Quaker Bridge, doubtfully native here.

Vicia caroliniana Walt. Spring Vetch

On gravelly, shaly or rocky slopes in open places, thickets and open woods. Frequent or common in such locations in and bordering the Allegheny valley but apparently absent from the higher portions of the park.

MELILOTUS ALBA Desv. White Sweet Clover, White Melilot

A weed along the Erie Railroad north of Quaker Bridge and doubtless elsewhere.

MELILOTUS OFFICINALIS (L.) Lam., *M. altissima* Thuill. Yellow Sweet Clover, Yellow Melilot

Along railroad near Salamanca, (Alexander); and doubtless elsewhere.

Apios tuberosa Moench., *Glycine Apios* L. Groundnut

Moist alluvial thickets, frequent in the lower valleys. Riverside Junction at north end of Tunungwant valley, thickets opposite Red House, thickets near Cold Spring and Quaker Bridge, Breed's run etc.

Amphicarpa monoica (L.) Ell., *Falcata comosa*. Hog Peanut

In moist or wet thickets and open places. Common on the lowlands of the Allegheny and Tunungwant valleys but frequent in suitable places even toward the higher ridges.

OXALIDACEAE (Wood Sorrel Family)

Oxalis Acetosella L., *O. montana* Raf. Wood Sorrel

In moist or wet humus of the more heavily forested areas of the park, preferring the shade of hemlocks. Common.

Oxalis europea Jord., *O. corniculata* Gray's Man. Yellow Wood Sorrel

In moist, wet or dry situations, in shady or open places, often in fields and waste places. Very common. The forma **villicaulis** Wiegand, equally abundant. See Rhodora 27: 113. 1925.

GERANIACEAE (Geranium Family)

Geranium maculatum L. Wild Geranium, Wild Cranesbill

Dry, stony, gravelly or sandy banks in poor soil. Common. Not infrequent, however, in richer soils

(Photo by Buffalo Society of Natural Sciences)

Figure 14 Flowering Wintergreen, *Polygala paucifolia*

and humus of open forested areas, sometimes in alluvial soil.

POLYGALACEAE (Milkwort Family)

Polygala paucifolia Willd. (figure 14). Fringed Polygala, Flowering Wintergreen

In sandy or gravelly soil of dry woods and banks. Infrequent. Slopes and summit of Elko mountain, Bradford road near state line, and elsewhere chiefly on the conglomerate soils of the higher ridges.

Polygala viridescens L., *P. sanguinea* L. Field or Purple Milkwort

In moist, sandy or gravelly, usually sterile soil. Rare. Butler's run.

Polygala verticillata L. Whorled Milkwort

In sandy or gravelly soil usually in open sunny situations. Infrequent. Opposite Red House, Cold Spring.

EUPHORBIACEAE (Spurge Family)

Acalypha virginica L. Three-seeded Mercury

In dry soil of open woodlands, banks and slopes. Infrequent. Pine hill near Randolph.

EUPHORBIA NUTANS Lag., *E. Preslii* Guss. Spurge

Common along the railroads in the Allegheny valley.

EUPHORBIA HIRSUTA (Torr.) Wiegand. Hairy Spurge

E. vermiculata Raf. in N. Y. State Mus. Bul. 254:471. 1924.

With the preceding species common along most of the railroads of the region, and rarely in roadside ditches.

EUPHORBIA MACULATA L. Milk Purslane

Common chiefly along the railroads but sometimes in cultivated soil. All three species of Euphorbia just mentioned appear to be introduced and not native of this region.

EUPHORBIA CYPARISSIAS L. Spurge

Indian cemetery near Quaker Bridge and elsewhere. Not common.

CALLITRICHACEAE (Water Starwort Family)

Callitriche heterophylla Pursh. Water Starwort

In slow streams, ditches and pools. Rare. Wolf run at Elko, Red House creek, Pool near Quaker run above Headquarters etc.

ANACARDIACEAE (Cashew Family)

Rhus typhina L. Staghorn Sumach

Dry banks and thickets, usually in gravelly or sandy soil. Occasional. Quaker Bridge.

Rhus glabra L. Smooth Sumach

In sandy, gravelly, sterile or acid soil on the higher ridges of the conglomerate formation and on bluffs, banks and benches of the Allegheny valley. Infrequent.

Rhus copallina L. Dwarf Sumach

In sterile sandy soil of the burned over bottomlands about a mile south of Quaker Bridge, between the railroad and the river.

Rhus Toxicodendron L. Poison Ivy, Poison Oak

Climbing on trees or sprawling over the ground in dry or moist open places, thickets and open woods, chiefly in the lower valleys and on the bottomlands of the Allegheny and Tunungwant, var. **radicans** (L.) Torr.

Rhus Vernix L. Poison Sumach, Poison Dogwood, Poison Elder

In boggy acid soil. Rare. Not found within the park area, but frequent in the swamps and bogs along the edge of the glacial drift near Steamburg and Randolph.

AQUIFOLIACEAE (Holly Family)

Ilex monticola Gray, *I. montana* (T. & G.) Gray. Large-leaved Holly

In moist or rather dry, often somewhat acid or but slightly fertile humus of open woods, thickets and banks chiefly above the lower valleys. Infrequent. Bradford road near state line, divide between Red House and Limestone runs, Rock City north of Salamanca, Mount Onondaga, Olean Rock City, (all on the conglomerate soils), Cain run, headwaters of Stoddard brook, Quaker run above Buffalo camp etc. On Cayuga mountain a very pubescent-leaved form approaching var. **mollis** (Gray) Britton, and at Gardener's rock, the typical variety.

Ilex verticillata (L.) Gray. Winterberry, Black Alder

In swampy woods, thickets and open places, usually in acid soil. Common south of Quaker Bridge in the Allegheny valley, around the marshy pond on Pine hill, bogs and swamps along the edge of the glacial drift near Steamburg and Randolph etc.

Nemopanthus mucronata (L.) Trelease, Mountain Holly

In acid bogs and swamps along the edge of the glacial drift near Steamburg, and rare in the sterile conglomerate soils along the summits of some of the ridges of the park area. Olean Rock City, Rock City north of Salamanca etc.

CELASTRACEAE (Staff Tree Family)

Evonymus obovatus Nutt. Running Strawberry Bush

In moist, fertile humus of upland forests. Very rare. Headwaters of Stoddard brook, Rock City four miles north of Salamanca. Doubtless more abundant before the park area was lumbered.

Celastrus scandens L. American Bittersweet

In moist thickets along streams and bottomlands. Infrequent. North of Quaker Bridge etc.

ACERACEAE (Maple Family)

Acer saccharinum L. Silver Maple

In alluvial soil and low swampy woods along the Allegheny and Tunungwant valleys. Infrequent.

Acer rubrum L. Red Maple, Soft Maple

Common in the swampy woods and moist or wet alluvial soil of the Allegheny and Tunungwant valleys and in moist woods on the slopes and ridges throughout the park area.

Acer saccharum Marsh. Sugar or Rock Maple

A very common and characteristic forest tree of all portions of the park area, and occasional on the lowlands of the valleys, less frequent or rare on the conglomerate soils of the higher ridges.

Acer pennsylvanicum L. Striped Maple, Moosewood

In moist soil of ravines and slopes throughout most sections of the park area above the lower valleys, especially abundant in the sterile conglomerate soils of some of the higher ridges.

Acer spicatum Lam. Mountain Maple

In damp soil and wet gravelly or stony places along most of the streams of the park above the

lower valleys, springy places on slopes in open woods or thickets and in acid bogs and swamps, such as the "Balsam swamp" in Red House valley. Occasional even in the sterile soils of the higher ridges.

Acer Negundo L. Box Elder

In alluvial soil. Rare. Allegheny river valley near Tunungwant creek.

BALSAMINACEAE (Touch-me-not Family)

Impatiens pallida Nutt. Pale Touch-me-not, Jewelweed

Along the smaller streams and brooks in wet gravelly soil, and borders of swamps. Infrequent.

Impatiens biflora Walt. Spotted Touch-me-not

In similar situations and in moist or wet open places, more abundant and generally distributed throughout the park area.

RHAMNACEAE (Buckthorn Family)

Ceanothus americanus L. (figure 15). New Jersey Tea

On banks, in open woods and thickets, in sterile or acid, sandy, gravelly or rocky soil. Infrequent. Along road toward Elko, slope of Elko mountain, banks both north and south of Quaker Bridge, slopes near Cold Spring, Huckleberry hill, benches opposite Red House, Carrollton etc.

VITACEAE (Grape Family)

Psedera quinquefolia (L.) Greene, *Parthenocissus quinquefolia* Planch. Virginia Creeper, Woodbine, Five-leaved Ivy

In low woods, thickets, banks and rocky slopes, usually climbing on trees, fences or other support, but sometimes sprawling over the ground. Infrequent, and found chiefly along the valleys and streams of the region.

(Photo by New York State Museum)

Figure 15 New Jersey Tea, *Ceanothus americanus*

Vitis aestivalis Michx. Summer, or Pigeon Grape

In rather dry, stony or gravelly soil. Frequent on the lower slopes and bluffs of the region in open places, thickets and borders.

Vitis vulpina L. Frost Grape

In alluvial, sandy or gravelly soil, along the bottomlands of the Allegheny and Tunungwant valleys. Frequent.

TILIACEAE (Linden Family)

Tilia americana L. Basswood, Linden

On wooded slopes, ravines and bottomlands. Common and in many portions of the Park a characteristic forest tree of the region. Mainly absent from the conglomerate soils of the higher ridges.

MALVACEAE (Mallow Family)

MALVA ROTUNDIFOLIA L. Round-leaved Mallow, Cheese

A weed of fertile cultivated soil and waste places, rare and confined to the cultivated areas surrounding the park area. Occasional or infrequent.

MALVA MOSCHATA L. Musk Mallow

A weed of roadsides, fields and waste places. Infrequent in the Allegheny and Tunungwant valleys.

HYPERICACEAE (St John's-wort Family)

Hypericum Ascyron L. Great St John's-wort

On gravelly bars of streams and rivers, alluvial banks and marshes. Rare. Elko, swamp at Randolph etc.

HYPERICUM PERFORATUM L. Common St John's-wort

Usually in dry, hard or sandy soil of fields and roadsides. Very common and not infrequent in open places throughout most sections of the park area.

Hypericum punctatum Lam. Spotted or Corymbed St John's-wort

In moist gravelly places in open woods or thickets along the lower stream courses, and especially in moist soil and swampy places along the bottomlands of the Allegheny and Tunungwant valleys.

Hypericum mutilum L. Small-flowered St John's-wort

In low wet fields and meadows, ditches, exsiccated depressions, acid bogs and shores of pools and ponds, frequent especially in the lower valleys, "Balsam swamp" in Red House valley, bogs along the edge of the glacial drift etc. Often simulates *H. boreale* in appearance, which should be found in this region.

Hypericum ellipticum Hook. Pale St John's-wort

In moist or wet, sandy or gravelly, usually sterile or acid soil. Infrequent and confined to the Allegheny and Tunungwant valleys.

Hypericum virginicum L., *Triadenum virginicum* Raf. Marsh St John's-wort

In acid bogs and swamps along the edge of the glacial drift near Steamburg, and hence not in the park area.

VIOLACEAE (Violet Family)

Viola cucullata Ait. Marsh Blue Violet

In boggy, springy or wet meadows and low woodlands, common, sometimes in wet gravelly places along streams. Quaker run, Quaker Bridge, Wolf run at Elko, Rock City north of Salamanca etc.

Viola septentrionalis Greene. Northern Blue Violet.

In moist or damp humus of open wooded areas as well as alluvial or gravelly soil in more or less open places along streams. Common.

Viola palmata L. Palmate-leaved Blue Violet

In sterile or acid gravelly, stony or sandy soil of the slopes and bluffs along the east side of the Allegheny valley and on the conglomerate soils of the higher ridges, in thin woods and thickets. Frequent.

Practically no specimens were seen with the typical palmately-lobed leaves and rather soft pubescence characteristic of this species in the Hudson valley. Plants approaching the typical form were found on Seneca mountain and on Butler run. Most of the plants have the mature leaves of the "dilatata" or "triloba" type, many of them unlobed or nearly so. Numerous gradations occur to plants which are quite glabrous (slopes of Elko mountain, Seneca mountain, summit on Stony run trail), or with a minute white puberulence on the petioles. On Huckleberry hill occurs a form with almost truncate, triangular leaf-blades, entirely glabrous even to the petioles, and which would scarcely be connected with *V. palmata* if occasional plants did not possess lobed leaves and varying degrees of pubescence connecting with the "dilatata" form. This smooth triangular-leaved form on Huckleberry hill possesses a striking similarity in leaf form to the coastal *Viola emarginata.*

Viola sororia Willd. Meadow Blue Violet

In moist, open woodlands, fields and alluvial bottomlands. Infrequent and for the most part lacking the characteristic soft pubescence of this species.

Viola rotundifolia Michx. Stemless Yellow Violet

In moist, fertile humus of damp woodlands and forests throughout the park area. Common and conspicuous on the forest floor by its dark green orbicular or ovate leaves, which in late summer are pressed rather flat to the leafy litter.

Viola Selkirkii Pursh. Great-spurred Violet

In rich or fertile humus of rocky slopes and ravines. Infrequent. Rocks above the north side Quaker run etc.

Viola pallens (Banks) Brainerd. Sweet White Violet

In mossy, springy places along brooks and streams and in acid bogs and swamps. Headwaters of Stoddard brook, upper Quaker run, Stony creek trail, springy places below Bradford road at state line, bogs of the glacial drift near Steamburg etc.

Viola incognita Brainerd. Woodland White Violet

In moist or damp humus of wooded slopes and ravines. Common throughout most sections of the park area above the Allegheny valley.

Viola blanda Willd. White Violet

In moist or rather dry humus, or wet depressions. Infrequent. Along Quaker run, woods of Three Sister's mountain and elsewhere.

Viola pubescens Ait. Stemmed Yellow Violet

In fertile or somewhat sterile, moist or dry humus of the forested areas, sometimes in open places. Common. The variety with glabrous capsules (var. **Peckii** House) also frequent.

Viola eriocarpa Schw., *V. scabriuscula* Schw. Smooth-stemmed Yellow Violet

In moist woods and ravines and alluvial soil. Common. The variety **leiocarpa** Fernald & Wiegand, also frequent and differing from the typical species by having glabrous capsules.

Viola canadensis L. Canada Violet

Moist, fertile woodlands on most of the slopes of the park region. Common. Rare on the sterile conglomerate soils of the higher ridges and the benches of the Allegheny valley.

Viola striata Ait. Pale, or Striped Violet

Occasional along Quaker run (Frank W. Johnson).

Viola conspersa Reichenb. Dog Violet

Common on moist banks, open woods and alluvial soil throughout most of the park region.

Viola rostrata Pursh. Long-spurred Violet

In rather dry open woods, on banks and along streams, usually in fertile soil. Rare or absent on the sterile soils of the higher ridges.

THYMELAEACEAE (Mezereum Family)

Dirca palustris L. Leather-Wood

In rich fertile, moist or wet soil of open woods, thickets and slopes. Infrequent. Slopes along north side of Quaker run, headwaters of Red House creek, woods up Stoddard brook etc.

LYTHRACEAE (Loosestrife Family)

Decodon verticillatus (L.) Ell. Water Willow, Swamp Loosestrife

In shallow water on the borders of Red pond near Steamburg. Unknown within the park area, where there are no suitable habitats for this plant.

Lythrum alatum Pursh. Wing-angled Loosestrife

Wet borders of Stetson pond near Randolph. Not known within the park area.

ONAGRACEAE (Evening Primrose Family)

Ludvigia palustris (L.) Ell., *Isnardia palustris L.* Water Purslane

Wet soil along the lower stream courses and borders of pools and ponds. Frequent. Along Red House creek, Wolf run at Elko, lower Quaker run, borders of bog near Steamburg etc.

Epilobium angustifolium L. Fireweed, Willow Herb

In stony, gravelly, usually sterile soil of openings and clearings in the forest, most abundant on burned over areas, and in such places often in moist or sterile soil, often along the smaller streams and in springy places of little shade. Common.

EPILOBIUM HIRSUTUM L. Hairy Willow Herb

Along Allegheny river east of Salamanca (Alexander). Of recent introduction and will doubtless become common along the larger valleys.

Epilobium molle Torr. (*E. strictum* Muhl.) Downy or Soft Willow Herb

Bogs and boggy depressions. Rare. Stetson pond near Randolph.

Epilobium densum Raf. (*E. lineare* Muhl.). Linear-leaved Willow Herb

In bogs and acid swamps. Rare. "Balsam swamp" in Red House valley. Frequent in the bogs along the edge of the glacial drift at Steamburg etc.

Epilobium glandulosum Lehm. var. **adenocaulon** (Hauusk.) Fernald, (Rhodora 20:34. 1918). Northern Willow Herb

In wet or moist, often boggy soil. Infrequent. Along Red House creek, on Pine hill etc.

Epilobium coloratum Muhl. Willow Herb

Wet soil along streams. Rare. English run (Frank W. Johnson). Coma of seeds only very slightly tinged with brownish, but leaves characteristic.

Oenothera muricata L. Small-flowered Evening Primrose

In sandy or gravelly, usually dry soil of open places, roadsides and waste ground. Common. (*Oenothera parviflora* L.)

Oenothera biennis L. Evening Primrose

Along stream banks, thickets, open woods and waste ground. Scarce, chiefly in and about the more thickly settled sections of the Allegheny and Tunungwant valleys. Perhaps not native in this region.

Oenothera tetragona Roth, *O. fruticosa* of Gray's Man. *Kneiffia tetragona* Pennell. Torr. Club Bul. 46: 370. 1919. Sundrops

In dry sandy or gravelly, usually acid soil of the bottomlands and benches of the Allegheny valley, sometimes in more moist situations. Common and when in bloom (late July and early August) very conspicuous.

Oenothera perennis L., *O. pumila* L. in Gray's Man., *Kneiffia perennis* Pennell. Small Sundrops

In moist sandy, gravelly or rocky soil of banks, bluffs and meadows. Frequent at lower altitudes along the Allegheny river. Rare or absent in the higher portions of the park area.

Circaea alpina L. Smaller Enchanter's Nightshade

Cool mossy places in dense forests, along mossy borders of brooks and springs, and in low or wet, usually mossy woods. Frequent. Along Quaker run, upper part of Red House creek, about springs on Three Sister's mountain, Stony creek, Pine hill etc.

Circaea latifolia Hill, *C. lutetiana* Gray's Man. Larger Enchanter's Nightshade

In moist or wet, usually fertile humus of open or dense woods. Common. Forms are found which seem to approach *C. intermedia* of Gray's Man. (*C. canadensis* Hill, see Rhodora 19: 87. 1917), but if this species occurs in this region it is not sufficiently distinct.

ARALIACEAE (Ginseng Family)

Aralia racemosa L. Spikenard

In moist, fertile woodlands, rocky banks and ravines. Infrequent. Along Quaker run, near Elko, toward Limestone cove from Onoville Station, wooded banks and slopes north of Quaker Bridge etc.

Aralia hispida Vent. Bristly Sarsaparilla

In sterile or acid gravelly or sandy soils, chiefly of conglomerate origin in open places and thickets along or near the summits of the higher ridges, and similar situations elsewhere. Bradford road near state line, Halls, Wolf run, Butler hill etc.

Aralia nudicaulis L. Wild Sarsaparilla

In moist or dry woodlands, on banks and sometimes in low wet woods. Common.

Aralia spinosa L. Hercules' Club, Angelica Tree

Bottomlands of the Allegheny river near Onoville. Rare.

Panax quinquefolium L. Ginseng

In rich moist humus of the forested areas throughout the park area except the sterile soils of the higher ridges and the Allegheny valley. Frequent, and doubtless would be common if not extensively gathered by the Indians.

Panax trifolium L. Groundnut

In low, wet or moist woods and wooded slopes covered with fertile or moist humus. Frequent.

UMBELLIFERAE (Parsley Family)

Sanicula marilandica L. Sanicle

In moist or dry open woods, banks and thickets. Common.

Sanicula gregaria Bicknell

In similar situations as the preceding specimens but not so abundant except on the Allegheny bottomlands.

Sanicula trifoliata Bicknell

In moist thin humus and often sterile soil. Infrequent. Along the Stony creek trail, on Pine hill and elsewhere.

Hydrocotyle americana L. Water Pennywort

In springy or wet gravelly places along brooks and streams, moist soil or wet places on the bottomlands and in wooded swamps. Locally frequent.

Osmorrhiza Claytoni (Michx.) Clarke. Hairy Sweet Cicely

Moist woods, ravines and open places. Very common except on the poor soils of the higher ridges.

Conioselinum chinense (L.) BSP. Hemlock-Parsley

In damp or wet woods and thickets. Rare. Woods near north end of the Tunungwant valley.

Cicuta maculata L. Water Hemlock, Musquash Root

In moist, wet or alluvial soil of the bottomlands. Frequent. Swamps and marshes near Quaker Bridge etc.

CARUM CARVI L. Caraway

In dry fields and along roadsides. Infrequent. Bee Hunter creek, Red House valley.

Sium suave Walt., *S. cicutaefolium* Schrank. Water Parsnip

In marshes, swamps and ditches, usually in shallow water. Frequent on the bottomlands of the Allegheny and Tunungwant valleys.

Cryptotaenia canadensis (L.) DC., *Deringa,* Kuntze. Honewort

Common in moist open woods and shaded places.

Zizia aurea (L.) Koch. Meadow Parsnip, Golden Alexanders

Frequent in moist or wet places along streams, on banks in open woods and in moist meadows.

Zizia cordata (Walt.) DC. Heart-leaved Alexanders

Thickets, banks and open woods on the gravelly sterile soils of the Allegheny valley. Rare. Along road from Quaker Bridge toward Steamburg, benches opposite Red House etc.

Taenidia integerrima (L.) Drude. Yellow Pimpernel

On stony, gravelly or sandy banks or similar situations in open woods along the Allegheny valley. Infrequent.

PASTINACA SATIVA L. Parsnip

A weed of waste or cultivated soil along roadsides and railroads. Frequent in the Allegheny valley.

Thaspium barbinode (Michx.) Nutt. Meadow Parsnip

In moist or dry soil in open places along the Allegheny and Tunungwant valleys.

Heracleum lanatum Michx. Cow Parsnip

In moist gravelly and sandy soil in open places. Common near Cold Spring station, doubtless elsewhere in the Allegheny and Tunungwant valleys, but not in the higher portions of the park area.

Angelica villosa (Walt.) BSP. (figure 16). Hairy Angelica

In sandy and gravelly acid soil of open places, banks and thickets in the Allegheny valley, not found elsewhere. Very common between Quaker Bridge and Red House, opposite Red House, and near Carrollton. A very conspicuous plant in late August when in full bloom. Reported from near Salamanca by Clinton.

(Photo by L. W. Brownell)

Figure 16 Hairy Angelica, *Angelica villosa*

Angelica atropurpurea L. Smooth Angelica

Borders of swamps and alluvial thickets. Rare. Allegheny bottomlands near Cold Spring, swamp at Randolph etc.

DAUCUS CAROTA L. Queen Anne's Lace

A common weed in fields, meadows and roadsides outside of the timbered areas.

CORNACEAE (Dogwood Family)

Cornus canadensis L. (figure 17). Dwarf Cornel, Bunchberry

In open woods, on banks and in boggy woods, apparently most abundant in acid soils. Frequent. Along Quaker run (rare), Bradford road near State line, Cayuga mountain, Blacksnake mountain, Pine hill, low woods near Quaker Bridge, "Balsam swamp" in Red House valley and elsewhere.

(Photo by New York State Museum)

Figure 17 Dwarf Cornel or Bunchberry, *Cornus canadensis*

Cornus florida L. (figure 18). Flowering Dogwood

In acid or sterile soil of rocky, sandy or gravelly woodlands and open places, locally common. Huckleberry hill, Elko mountain, thickets on the conglomerate soils of some of the higher ridges, and scattered elsewhere throughout the park area and the Allegheny valley.

Cornus rugosa Lam. *C. circinata* L'Her. Round-leaved Dogwood

In situations similar to the preceding species but also frequently in damper situations of more fertile soil. Huckleberry hill, Elko mountain etc.

Cornus Amomum Mill. Silky Dogwood, Kinnikinnik

In wet or alluvial soil of open or shaded places. Common along the lower stream courses and in the Allegheny and Tunungwant valleys.

Cornus stolonifera Michx. Red Osier Dogwood

In swamps and wet soil. Not observed in the park area but probably present along some of the streams. Common about the swamps, bogs and ponds along the edge of the glacial drift toward Randolph and Steamburg.

Cornus candidissima Marsh. *C. paniculata*, Gray's Man., *C. foemina* Mill. Panicled Dogwood

In alluvial or wet soil along the bottomlands of the Allegheny and Tunungwant valleys, often forming thickets which are conspicuous when in full bloom.

Cornus alternifolia L. f. Alternate-leaved Dogwood

In stony, gravelly or sometimes sandy soils. Common in open woods and thickets of the conglomerate formation on and adjacent to the higher ridges, scat-

(Photo by L. W. Brownell)

Figure 18 Flowering Dogwood, *Cornus florida*

tered elsewhere on the wooded slopes and open places of the park area and frequent on the bluffs and benches of the Allegheny valley.

Nyssa sylvatica Marsh. Black Gum, Sour Gum, Pepperidge

In low moist or wet woods of the Allegheny valley and infrequent along the drier slopes of the park area.

Gamopetalae

ERICACEAE (Heath Family)

Montorpa uniflora L. (figure 19). Indian Pipe, Corpse Plant

Saprophytic on deep humus. Common in most sections of the park area, but naturally absent on the sandy and gravelly benches of the lower valleys and from the conglomerate soils of the higher ridges.

Monotropa Hypopitys L. (figure 20). Pine-sap

Saprophytic on sterile or acid humus of open woods and thickets. Infrequent. Willis run, Butler run etc. (*M. lanuginosa* Michx.)

Chimaphila umbellata (L.) Nutt. Prince's Pine, Pipsissewa

In sandy or gravelly acid soil of open woods and thickets, chiefly on the conglomerate formation of the higher ridges and summits, occasionally elsewhere. Parker hill, Elko mountain, Blacksnake mountain etc.

Pyrola secunda L. Secund Shinleaf

In moist or dry acid litter on gravelly soils along or near the conglomerate formation on the higher ridges, occasionally elsewhere. Frequent.

Pyrola elliptica Nutt. Elliptic-leaved Shinleaf

In moist or dry woods, open places, thickets and swamps. Common, and apparently in both sterile and fertile soils and humus.

(Photo by the Buffalo Society of Natural Sciences)

Figure 19 Indian Pipe, *Monotropa uniflora*

Pyrola americana Sweet, *P. rotundifolia* var. *americana* Fernald. Shinleaf

In poor or somewhat sterile or acid soil of open woodlands and slopes, chiefly along the higher ridges, but occasionally elsewhere. Frequent.

(Photo by the Buffalo Society of Natural Sciences)

Figure 20 Pine-sap, *Monotropa Hypopitys*

Azalea nudiflora L. Pinkster, Pink Azalea

In sterile or acid soils of open woods, thickets and swamps, in this region chiefly on the upper slopes and ridges. This is the *Azalea prionophylla* Small (N. Y. State Mus. Bul. 254: 545. 1924), recently recognized by Rehder as *Rhododendron roseum* (Lois.) Rehder, Monog. Azaleas. Publ. Arnold Arb. 9:138, 1921 and by Wiegand, Rhodora 26:4. 1924, as *R. nudiflorum* var. *roseum* (Lois.) Wiegand.

Rhododendron maximum L. Great Laurel

Formerly along the Bradford road on the Pennsylvania side of the state line, and to be looked for elsewhere in the park.

Kalmia latifolia L. (frontispiece, figure 1) Mountain Laurel, Calico Bush

On gravelly and rocky banks and bluffs on the road toward Elko, Gardener's rock etc. Rare.

Chamaedaphne calyculata (L.) Moench. Leather-leaf, Cassandra

In very wet portions of the sphagnum bogs along the edge of the glacial drift near Steamburg. Not found within the park area.

Gaultheria procumbens L. Aromatic Wintergreen, Checkerberry

In acid gravelly or sandy soil of open woods, banks and clearings, chiefly along the higher ridges and slopes, occasionally elsewhere as in the "Balsam swamp" in Red House valley, the bogs of the glacial drift near Steamburg and the bluffs and benches along the Allegheny valley.

Epigaea repens L. (figure 21). Trailing Arbutus Mayflower

In gravelly, sandy or stony acid soil of open woods and banks. Infrequent. Huckleberry hill, Butler hill etc. Probably once more abundant before lumbering and fire. Reported from Salamanca by Clinton.

(Photo by New York State Museum)

Figure 21 Trailing Arbutus, *Epigaea repens*

Chiogenes hispidula (L.) T. & G. Creeping Snowberry

On logs, hummocks and stumps or on the ground in acid sphagnum bogs and swamps. Rare. "Balsam swamp" in Red House valley, bogs near Steamburg etc. Also called Moxie Plum and Capillaire.

Vaccinium stamineum L. Deerberry, Squaw Huckleberry

In sandy or gravelly, often sterile or acid soil of open woods, thickets, banks and ridges. Infrequent. Huckleberry hill, Elko mountain, Peters run, Butler hill etc.

Vaccinium pennsylvanicum Lam. Early or Low Bush Blueberry

In acid soil on dry slopes, thickets and bluffs. Common on Huckleberry hill and other bluffs along the Allegheny valley, elsewhere rare; mostly the form with smooth, broad leaves, *V. angustifolium* var. *laevifolium*. House, N. Y. State Mus. Bul. 243–44: 61. 1923.

At the Rock City our miles north of Salamanca is found the form with pubescent leaves and twigs, var. **myrtilloides** Fernald.

Vaccinium vacillans Kalm. Late Upland Blueberry

In dry, acid, gravelly and stony soil on Huckleberry hill and other situations similar to the preceding species, but less common.

Vaccinium canadense Kalm. Sour-top or Velvet-leaf Blueberry

In sphagum bogs and swamps. Rare. "Balsam swamp" in Red House valley, bogs near Steamburg etc.

Vaccinium corymbosum L. Swamp, Tall, or High Blueberry

In acid swamps and bogs near Steamburg. Not found in the park area. Also the var. **glabrum** Gray.

Vaccinium atrococcum (Gray) Heller. Black Blueberry

In acid bogs along the edge of the glacial drift near Steamburg. Rare.

Vaccinium Oxycoccus L. Small Cranberry

Open or shaded places in acid, sphagnous bogs along the edge of the glacial drift near Steamburg, and hence not found within the park area.

Gaylussacia baccata (Wang.) C. Koch. Black Huckleberry

In sandy or gravelly, sterile or somewhat acid soil on the bluffs, banks and benches along the Allegheny valley, the higher ridges and in the swamps of the glacial drift region toward Steamburg and Randolph. Frequent.

PRIMULACEAE (Primrose Family)

Lysimachia quadrifolia L. Cross-wort, Whorled Loosestrife

In sterile gravelly or sandy soil in open woods, thickets and on banks. Common on the bluffs, banks and benches along the Allegheny valley (Huckleberry hill, Elko mountain, opposite Red House etc.) and occasionaily on the higher ridges and open places throughout the park.

Lysimachia terrestris (L.) BSP. Bulb-bearing Loosestrife

In moist or wet alluvial soil, marshes and marshy meadows and borders of streams. Frequent throughout the park region and adjacent valleys.

LYSIMACHIA NUMMULARIA L. Moneywort, Yellow Myrtle

An infrequent weed in alluvial soil of fields and roadsides most common in the Allegheny and Tunungwant valleys.

Steironema ciliatum (L.) Raf. Fringed Loosestrife

In moist alluvial soil of open woods, thickets and banks. Common along the principal streams and in the bottomlands of the larger valleys.

Trientalis borealis Raf. *T. americana* (Pers.) Pursh. Starflower

In moist, fertile or rather sterile humus of the forested areas. Common.

OLEACEAE (Olive Family)

Fraxinus americana L. White Ash

In rich or fairly fertile soils of the slopes and valleys of the entire park region. A common and characteristic forest tree of the region.

Fraxinus nigra Marsh. Black Ash

In low wet woods and swamps of the bottomlands of the Allegheny and Tunungwant valleys. Frequent.

GENTIANACEAE (Gentian Family)

Gentiana Andrewsii Griseb. Closed Gentian

In moist or wet thickets and low woods, of the lower and larger valleys. Infrequent. Quaker run, Sunfish run, Willis run, Quaker Bridge, Salamanca etc. A form with white flowers was found near Salamanca by George W. Clinton.

Gentiana quinquefolia L. Stiff Gentian, Ague Weed

In moist gravelly or sandy soil of open woods and banks. Rare near Quaker Bridge.

Bartonia virginica (L.) BSP. Bartonia

Not found within the park area, but common in a bog near Steamburg.

Menyanthes trifoliata L. Buckbean

With the preceding species in a bog near Steamburg.

APOCYNACEAE (Dogbane Family)

Apocynum androsaemifolium L. Spreading Dogbane

Common on the poorer soils, especially in gravelly or sandy places in open woods, thickets, on banks, roadsides and along railroads.

Apocynum cannabinum L. Indian Hemp

Gravelly bars and banks along the Allegheny river. Infrequent. Elko.

ASCLEPIADACEAE (Milkweed Family)

Asclepias syriaca L. Common Milkweed

Roadsides, fields, open places along streams and waste ground. Frequent or common in the lower portions of the park area.

Asclepias phytolaccoides Pursh. Poke Milkweed

In sterile or slightly fertile soil of open woods, thickets and banks chiefly along the Allegheny and Tunungwant valleys; elsewhere rare.

Asclepias incarnata L. Swamp Milkweed

In wet alluvial soil or on gravelly bars and banks along the larger streams. Infrequent. Tunungwant valley, Elko, Red House etc.

CONVOLVULACEAE (Morning-Glory Family)

Convolvulus spithamaeus L. (figure 22). Upright or Low Bindweed

Common on banks and along railroad near Red House in gravelly and rocky sterile soil.

(Photo by New York State Museum)

Figure 22 Upright or Low Bindweed, *Convolvulus spithamaeus*

Convolvulus sepium L. Hedge Bindweed, Wild Morning-Glory

Moist alluvial soil of thickets and open places on the bottomlands of the Allegheny and Tunungwant valleys.

Cuscuta Gronovii Willd. Common Dodder

In moist thickets, swamps and bottomlands overgrown with herbaceous vegetation. Frequent in the Allegheny and Tunungwant valleys. Not seen within the park area.

POLEMONIACEAE (Phlox Family)

Phlox divaricata L. Blue Phlox

In rich, moist humus in open woods, thickets and on shaded banks of the lower ravines, and principal stream valleys of the park area. Common. Also on the bottomlands of the Allegheny valley.

Phlox maculata L. Wild Sweet William

In moist alluvial soil of open woods, thickets and banks of the lower and larger valleys. Infrequent. Tunasassa, Quaker Bridge etc.

PHLOX PANICULATA L. Garden Phlox

Roadside near Tunasassa, escaped from cultivation.

Polemonium reptans L. Greek Valerian, Blue-bell

In wet or moist, usually gravelly soil of shaded springy places, moist alluvial thickets of the bottomlands and in sphagnum swamps; locally abundant. Springy places on the Stony run trail, alluvial thickets north of Quaker Bridge, "Balsam swamp" in Red House valley.

HYDROPHYLLACEAE (Water-leaf Family)

Hydrophyllum virginianum L. Virginia Water-leaf

In rich humus or moist or somewhat dry woodlands and banks. Common.

Hydrophyllum canadense L. Broad-leaved Water-leaf
In rich humus of damp cool shaded forests, especially in springy places. Common.

BORAGINACEAE (Borage Family)

BORAGO OFFICINALIS L. Borage
Waste ground near Salamanca (Alexander).

CYNOGLOSSUM OFFICINALE L. Hound's-Tongue
Borders of open woods, thickets and fields. Infrequent.

Cynoglossum boreale Fernald. Wild Comfrey
In open woods on rather hard or somewhat sterile soil, occasional in richer humus of second growth forest. Not common. Slopes of Seneca mountain, Stony run trail etc. Reported from Rock City north of Salamanca by Clinton.

Lappula virginiana (L.) Greene. Beggar's Lice
In moist, usually fertile soil, of open woods thickets and bottomlands. Frequent.

LAPPULA ECHINATA Gilib. *L. Lappula* Karst. Stickseed
Common on the cinder banks of the Erie Railroad north of Quaker Bridge, and occasionally elsewhere.

SYMPHYTUM OFFICINALE L. Common Comfrey
In dry or moist alluvial soil of fields, thickets and waste ground in the lower and larger valleys. Infrequent.

MYOSOTIS SCORPIOIDES L. Forget-me-not
In wet gravelly or alluvial soil along the lower stream courses, and in swales and marshy places of the river bottomlands. Frequent.

Myosotis laxa Lehm. Small-flowered Forget-me-not
Springy, boggy and mossy, usually shaded places along brooks and streams. Infrequent.

VERBENACEAE (Vervain Family)

Verbena urticaefolia L. White Vervain

In dry or moist soil of thickets and open places in the lower and larger valleys. Frequent.

Verbena hastata L. Blue Vervain

In moist or wet gravelly soil or alluvium along streams in open places and in swamps and marshes common in the lower valleys, but rare or absent from the higher portions of the park.

LABIATAE (Mint Family)

Teucrium canadense L. Wood Sage, or Germander

Moist thickets in gravelly soil or alluvium along the lower streams. Rare. Tunasassa.

Scutellaria lateriflora L. Mad-dog, or Blue Skullcap

In wet gravelly soil along streams and in swamps and bogs. Infrequent in the upland parts of the park but common in the lowlands.

Scutellaria galericulata L. Marsh Skullcap

In wet soil along streams and in marshes. Rare within the park area but frequent on the bottomlands.

Scutellaria canescens Nutt. *S. incana* Muhl. Downy Skullcap

In moist thickets along the lower part of Quaker run, near Tunasassa. Rare. Not previously reported from New York State.

Agastache scrophulariaefolia (Willd.) Kuntze. Great Hyssop

In moist thickets of the Allegheny bottomlands. Rare. Near Elko.

NEPETA CATARIA L. Catnip

An occasional or frequent weed in the cleared and settled portions of the region.

NEPETA HEDERACEA (L.) Trev. Gill, Ground Ivy, Gill-over-the-Ground

A frequent weed in damp shaded soil, especially in the region surrounding the park area.

Prunella vulgaris L. Heal-all, Self-heal

In moist or fertile, sometimes rather sterile soil of open woods, fields, roadsides and banks. Common.

LEONURUS CARDIACA L. Motherwort

A frequent weed of the lowlands, in moist fertile soil.

Stachys tenuifolia Willd. var. **aspera** (Michx.) Fernald. Hedge Nettle

In damp or marshy alluvial soil in open places on the bottomlands of the Allegheny and Tunungwant valleys and cinder banks of the railroads. Common.

Monarda didyma L. Oswego Tea, Bee Balm

In moist or wet openings of woodlands and thickets and especially along or near streams in gravelly or loamy alluvial soil, common particularly at lower elevations in the region and one of the most conspicuous and beautiful wild flowers of the region.

Monarda clinopodia L. Balm

In damp thickets and open places on the bottomlands of the Allegheny valley. Infrequent. Quaker Bridge, Cold Spring, Carrollton etc.

Monarda fistulosa L. Wild Bergamot

On gravelly or rocky banks in open places along the Allegheny valley, sometimes in sandy or semialluvial soil. Frequent. The var. **mollis** (L.) Benth. most often seen. Var. **rubra** Gray. *M. media* Willd. Purple Bergamot.

In situations similar to the preceding species, but rare. Cold Spring, near Quaker Bridge, Onoville etc.

Hedeoma pulegioides (L.) Pers. American Pennyroyal

Common in open woods and thickets on Pine hill, outside of the park area, and to be looked for within the park.

Clinopodium vulgare L. *Satureja vulgaris* (L.) Fritsch. Basil

In moist soils of various sorts in fields and along roadsides. Common outside of the timbered areas. In the Allegheny valley is found a white-flowered form.

Lycopus uniflorus Michx. Bugleweed

In wet, marshy or boggy places along streams and lowlands, where common, but occasional along most of the brooks and streams of the park area in open places.

Lycopus virginicus L. Bugleweed

In similar situations. Rare. Along Red House creek.

Lycopus americanus Muhl. Water Horehound

In wet or marshy soil along streams and in swamps, and low wet woods. Very common except in the higher and drier portions of the region.

Mentha arvensis L., var. **canadensis** (L.) Briq. Wild Mint

In wet soil, usually in open places, chiefly on the bottomlands of the Allegheny and Tunungwant valleys, occasional up most of the valleys of the park region.

MENTHA PIPERITA L. Peppermint

In moist or alluvial soil of the Allegheny valley. Infrequent. Quaker Bridge.

GALEOPSIS TETRAHIT L. Hemp Nettle

In gravelly or stony soil, usually in moist places, in open woods and fields, occasional along many of the roads and trails in the park area. Common on Pine hill.

Collinsonia canadensis L. Stoneroot, Horse Balm, Richweed

In moist fertile woods, shaly and rocky slopes, usually in damp or moist situations. Locally common.

SOLANACEAE (Nightshade Family)

SOLANUM CAROLINENSE L. Horse Nettle

In waste places in fertile soil. Infrequent. Elko, Tunungwant valley.

SOLANUM DULCAMARA L. Blue-flowered Nightshade, European Bittersweet

In moist, usually alluvial soil of the lowlands along the Allegheny and Tunungwant valleys.

Solanum nigrum L. Common Nightshade

In moist, usually fertile stony or loamy soil of shaded place. Rare. Quaker Bridge (Alexander).

SCROPHULARIACEAE (Figwort Family)

VERBASCUM THAPSUS L. Common Mullein, Velvet-leaf

A frequent weed in the poorer soils of the region.

VERBASCUM BLATTARIA L. Moth Mullein

Roadsides and banks in dry or gravelly soil and along the cinder banks of railroads. Frequent.

LINARIA VULGARIS L. Butter-and-Eggs, Yellow Toadflax

A common weed in the cleared portion of the region and especially in the larger valleys.

LINARIA MINOR (L.) Desf. Lesser Toadflax

A common weed along the cinder banks of the railroads.

Scrophularia marilandica L. Maryland Figwort, or Pilewort

In moist fertile stony or gravelly soil of open woods and thickets. Infrequent. Between Onoville station and Limestone cove and elsewhere.

Scrophularia lanceolata Pursh. Hare Figwort

In similar situations but usually in drier soil and more frequent especially on the gravelly and sandy bottomlands of the Allegheny valley. *S. leporella* Bicknell, see Torreya 22: 81. 1922.

Chelone glabra L. Turtlehead

Common in moist or wet gravelly soil along most of the brooks and streams of the park, and in open marshy places on the bottomlands.

Mimulus ringens L. Monkey Flower

In wet gravelly soil along the lower stream courses and in wet places on the bottomlands and in the bogs along the edge of the glacial drift. Rare above the larger stream courses.

Gratiola neglecta Torr. *G. virginiana*, of Gray's Man. See Rhodora 20: 63. 1918. Clammy Hedge Hyssop

In moist or wet and muddy soil of springy places in open woods, along streams and on the bottomlands. Infrequent. Three Sister's mountain, near Quaker Bridge etc.

Ilysanthes dubia (L.) Barnh. False Pimpernel

In alluvial muddy or wet sandy shores. Rare. Near Cold Spring.

Veronica americana Schw. American Brooklime

In wet gravelly places along brooks, streams, springy places and marshy lowlands. Common.

(Photo by New York State Museum)

Figure 23 Culver's Root, *Veronica virginica*

Veronica scutellata L. Marsh Speedwell

In open marshy places and bogs. Infrequent. Marsh near Cold Spring, near Quaker Bridge and elsewhere.

Veronica officinalis L. Common Speedwell, Fluellin

In sterile or sometimes fertile soil on gravelly or stony open wooded slopes, banks and fields. Common.

VERONICA CHAMAEDRYS L. Germander Speedwell

In moist fertile humus of open stony places. Infrequent. Bee Hunter run, English run etc.

VERONICA SERPYLLIFOLIA L. Thyme-leaved Speedwell

Common in moist, open grassy places on Pine hill, Elko mountain and doubtless elsewhere.

Veronica virginica L. *Leptandra virginica* Nutt. (figure 23) Culver's Root

In moist sandy and gravelly depressions of the Allegheny bottomlands near Quaker Bridge, Tunasassa etc. Locally common and conspicuous when in bloom.

Aureolaria virginica (L.) Pennell, *Gerardia flava*, of Gray's Man., *Dasystoma flava* of Britton & Brown. Downy False Foxglove

In sandy, gravelly and stony soils, usually more or less sterile in nature. Frequent along the bluffs, slopes and benches of the Allegheny valley.

Aureolaria glauca (Eddy) Raf. Smooth False Foxglove

In situations similar to the preceding but more abundant, and often in more exposed and drier situations. This is the *Gerardia virginica* of Gray's Man., *Gerardia quercifolia* Pursh (a very appropriate name) and *Dasystoma virginica* of Britton & Brown. Pennell (Torreya 19:205. 1919, also Rhodora 20:

(Photo by Edward Hale Lincoln)

Figure 24 Cancer-root, *Conopholis americana*

133. 1918) and Blake (Rhodora 20: 66. 1918) have discussed the nomenclature of these and related species, and Wiegand (Flora of the Cayuga Lake Basin, 375. 1926) adopts the name *Aureolaria flava* (L.) Farwell, for this species. The name here used is that adopted in New York State Mus. Bulletin 254: 627. 1924 in the Annotated List of the Ferns and Flowering Plants of New York State.

Pedicularis canadensis L. Wood Betony, Lousewort

In gravelly or sandy, rather dry sterile or somewhat fertile soil of open woodlands and forested areas. Common.

Melampyrum lineare Lam. Cow Wheat

Common in open woodlands, thickets and banks in sterile, often acid soils of the higher ridges and on the slopes, bluffs and benches of the Allegheny valley.

OROBANCHACEAE (Broom Rape Family)

Epifagus virginiana (L.) Bart. Beechdrops

In moist or dry woods, parasitic on the roots of beech trees. Common, but not conspicuous until late summer and autumn.

Conopholis americana (L. f.) Wallr. (figure 24) Cancer-root, Squawroot

Parasitic on the roots of oak and chestnut in poor or sterile soil. Rare. Butler's run.

Orobanche uniflora L. *Aphyllon uniflorum* Gray, *Thalesia uniflora* Britt. One-flowered Cancer-root

In moist open woods, thickets and on banks. Rare. Parasitic on roots of herbaceous plants and ferns.

LENTIBULARIACEAE (Bladderwort Family)

Utricularia macrorhiza LeConte, *U vulgaris* var. *americana* Gray. Common or Greater Bladderwort

Floating in the quiet waters of ponds and pools or slow streams. Rare. Tunungwant valley.

PLANTAGINACEAE (Plantain Family)

PLANTAGO MAJOR L. Broad-leaved Plantain

Roadsides, fields and waste places, occasionally along woodland roads. Common.

PLANTAGO LANCEOLATA L. Rib-grass, Narrow-leaved Plaintain

In similar situations, less frequent.

RUBIACEAE (Madder Family)

Galium lanceolatum Torr. Torrey's Wild Liquorice

In gravelly or stony, sometimes sandy soil of open dry or moist woodlands and thickets. Common.

Galium circaezans Michx. Wild Liquorice, Cross-Cleavers

In somewhat sterile or acid soil of open woods and thickets, especially on the higher ridges and on the slopes, bluffs and benches of the Allegheny valley. Frequent.

GALIUM APARINE L. Cleavers, Goose Grass

In moist woods and thickets or open places. Common.

Galium triflorum Michx. Sweet-scented Bedstraw.

In open woods, along stream thickets and on banks. Common.

Galium asprellum Michx. Rough Bedstraw

Common in moist or wet thickets and open places along most of the streams of the park area, usually in alluvial or gravelly soil.

Galium Claytoni Michx. Clayton's Bedstraw

In marshes of the glaciated region near Steamburg. Frequent.

Galium palustre L. Marsh Bedstraw

In wet or marshy soil along the valleys of the park, swamps of the bottomlands and occasionally elsewhere. Infrequent.

Galium tinctorium L. Stiff Marsh Bedstraw

In situations similar to the preceding species and in mossy or boggy woods and meadows. Frequent in the lower levels of the region.

Mitchella repens L. (figure 25) Partridge Berry

In moist or dry woods and forested areas. Common and generally distributed except on the bottomlands.

Cephalanthus occidentalis L. Buttonbush

In swamps and marshes, usually in shallow water. Rare. Seen only at Randolph outside of the Park area but probably occurs in the Tunungwant and Allegheny valleys.

Houstonia caerulea L. Bluets

In light, poorly drained soil in open woods, fields and banks. Common.

CAPRIFOLIACEAE (Honeysuckle Family)

Diervilla Lonicera Mill. Bush Honeysuckle

In sterile or acid soil, usually in stony or gravelly places of open woods, thickets and banks. Common except on the more fertile forested slopes of the region.

Figure 25 Partridge Berry, *Mitchella repens* (Photo by New York State Museum)

Lonicera canadensis Marsh. Fly Honeysuckle

In moist woodlands on fertile stony or gravelly soil. Common.

Lonicera dioica L. Glaucous Honeysuckle

On banks and gravelly benches of the Allegheny valley opposite Red House. Rare. The var. **glaucescens** (Rybd.) Butters, more frequent and generally distributed in acid rocky or gravelly soil on the slopes and bluffs of the river valley from Elko to Red House, and on the conglomerate soils of the higher ridges (divide between Limestone and Red House creeks).

Symphoricarpos albus (L.) Blake, Rhodora 16:118. 1914, S. *racemosus*. Gray's Man. Snowberry

Stony banks near Onoville. Rare.

Triosteum perfoliatum L. var. **aurantiacum** (Bick.) Wiegand, Rhodora 25: 199. 1923. Horse Gentian, Feverwort

Moist, fertile soil of open woods, thickets and banks along and near the lower and larger valleys. Rare. Quaker Bridge, Peters run etc.

Viburnum alnifolium Marsh. Hobble-bush, Witch Hobble

In moist, fertile humus of the undisturbed forested areas. Common. Occasional elsewhere.

Viburnum Opulus L. Cranberry Tree

In low, wet woods and swamps of the bottomlands, infrequent. Several places between Onoville and Cold Spring.

Viburnum acerifolium L. Maple-leaved Viburnum, Arrow-wood

Very common in sterile or acid rocky and gravelly soils on the conglomerate formation of the upper

ridges and summits and on the bluffs, slopes and banks along the east side of the Allegheny valley from Onoville to Cold Spring, and doubtless elsewhere. Occasional in more fertile soils.

Viburnum dentatum L. Arrow-wood

In alluvial swampy places along the Allegheny valley near Quaker Bridge, around the swamp pond on Pine hill, and common only in the swamps and bogs along the edge of the glacial drift near Steamburg.

Viburnum cassinoides L. Withe-rod, Wild Raisin

In situations similar to the preceding but usually in more acid soil. Frequent. Tunungwant valley, "Balsam swamps" in Red House valley, bogs near Steamburg, Pine hill swamp pond, Olean Rock City etc.

Viburnum Lentago L. Nannyberry, Sheepberry

In moist alluvial soil along the banks of the Allegheny river where common and often forming with or adjacent to the Wild Plum, extensive thickets.

Sambucus canadensis L. Common Elder

In damp soil in open places. Common. Usually called "elderberry."

Sambucus racemosus L. Red-berried Elder

In moist soil, in more shaded situations than the preceding species, often on gravelly or stony banks and in ravines. The coral-red fruit is ripe about the time the common elder blooms.

DIPSACACEAE (Teasel Family)

DIPSACUS SYLVESTRIS Huds. Common Teasel

Common in gravelly soil of neglected fields near Onoville.

CUCURBITACEAE (Gourd Family)

Echinocystis lobata (Michx.) T. & G. Wild Cucumber, Balsam Apple

In alluvial soil of damp thickets along the bottomlands of the Allegheny and Tunungwant valleys. Frequent.

LOBELIACEAE (Lobelia Family)

Lobelia cardinalis L. Cardinal-flower

In alluvial or gravelly soil along the lower stream courses and the Allegheny river. Infrequent.

Lobelia siphilitica L. Blue Lobelia

In wet gravelly soil along the lower streams and in springy and marshy places. Frequent.

Lobelia spicata Lam. Slender Lobelia

In moist sandy soil of the bottomlands. Scarce. Near Quaker Bridge.

Lobelia inflata L. Indian Tobacco

In dry open places often on acid soil overgrown with hair moss *(Polytrichum)*, in springy places and borders of swamps and ponds. Locally frequent.

COMPOSITAE (Aster Family)

Eupatorium maculatum L. (Wiegand, Rhodora 22: 62. 1920); *E. Bruneri* Gray (Mackenzie, Rhodora 22: 157. 1920) Joe-Pye Weed

In moist soil of thickets and meadows chiefly along the lower stream courses and river bottomlands. Common.

Eupatorium purpureum L. (Wiegand); *E. maculatum* (Mackenzie) Joe-Pye Weed

In alluvial, moist soil of thickets, banks and open woods along the Allegheny river. Less frequent and more strictly confined to the alluvium of the valley.

Eupatorium falcatum Michx. (Wiegand); *E. trifoliatum* L. (Mackenzie)

In dry or moist gravelly soil of open woods, and banks along the Allegheny valley. Infrequent. Rare in openings of the forest on the upper slopes of the park.

Eupatorium perfoliatum L. Boneset, Thoroughwort

In moist or wet soil of open places. Infrequent in wet places and along the principal streams, locally on the bottomlands.

Eupatorium urticaefolium Reich. White Snakeroot

Moist gravelly or rocky wooded slopes, ravines and bottomlands. Common.

Solidago squarrosa Muhl. Goldenrod

Rocky banks. Rare. Gardener's rock. The species of Solidago are as a usual thing indiscriminately called "goldenrod." Distinctive names have been adopted for them, however, by Britton & Brown (Illustrated Flora).

Solidago bicolor L.

In sterile sandy and gravelly soils of the bottomlands and on adjacent bluffs and benches. Infrequent.

Solidago hispida Muhl.

In dry or sterile soil of the Allegheny valley and lower slopes of the Park area. Infrequent.

Solidago caesia L.

Moist or dry open woods, thickets and borders. Common.

Solidago flexicaulis L. *S. latifolia* L.

In gravelly or stony soil of open woods, banks and bluffs. Frequent or in some places common.

Solidago juncea Ait.

In dry, rocky, gravelly or sandy, usually acid soil. The common early goldenrod of the region and often in bloom by the middle of July. The var. **scabrella** (Gray) Fernald, near Quaker Bridge.

Solidago arguta Ait.

In sandy or stony soil of open woods, thickets and banks. Common especially in the lower valleys.

Solidago patula Muhl.

In wet or marshy soil. Rare. Sunfish run.

Solidago rugosa Mill.

Very common in dry or gravelly, sometimes sandy soil, in open places, thickets and on banks.

Solidago ulmifolia Muhl.

Stony banks in thin woods near Salamanca. Rare.

Solidago nemoralis Ait.

In dry, usually sterile soil of open places. Reported from Quaker run by Frank W. Johnson in August 1921.

Solidago serotina Ait.

In moist or wet soil of open fields, meadows, banks and thickets. Common. The var. **gigantea** (Ait.) Gray, around the borders of acid bogs and ponds along the edge of the glacial drift near Randolph and Steamburg.

Solidago altissima L.

In moist or rather dry soil of open places and thickets chiefly along the lower streams and valleys. Frequent. Frank W. Johnson also reports finding the variety **procera** Fernald, in 1921.

Solidago canadensis L.

In sterile gravelly soil around the marsh-pond on Pine hill. Rare.

Var. **Hargeri** Fernald, Rhodora 17: 11. 1915. Open places in moist soil. Uncommon. Holt's run, Elko etc. This has the tiny heads and lanceolate triple-nerved leaves of typical *S. canadensis*, but the stems are villous-pubescent throughout.

Solidago graminifolia (L.) Salisb.

In sandy acid soil of the bottomlands, near Quaker Bridge. The var. **Nuttallii** (Greene) Fernald, common or frequent throughout the park area in open places and thin woods, often in sterile, but not always acid soil.

Aster divaricatus L. White Wood Aster

In dry or moist open woods, on banks and in thickets. Very common.

Aster Schreberi Nees.

In dry or moist rocky woods. Scarce. Slide hollow, Elko, Quaker run etc.

Aster macrophyllus L. Large-leaved Aster

On moist banks and open woodlands. Locally common and very conspicuous when in bloom.

Aster cordifolius L. Blue Wood Aster

In dry soil of open woods, thickets, roadsides and fields. Very common.

Aster sagittifolius Wed.

In dry, gravelly and stony soil of thickets and open woods. Rare. Near Elko and woods on Sunfish run.

Aster undulatus L.

In sandy and gravelly soil of the Allegheny valley. Infrequent. Salamanca, Carrollton etc., also the var. **loriformis** Burgess, at Carrollton.

Aster novae-angliae L. New England Aster

Moist or wet gravelly or loamy soil along streams and bottomlands. Rare.

Aster laevis L.

In dry or sterile sandy or gravelly soil, sometimes on shaly or rocky banks. Infrequent.

Aster puniceus L.

In very wet soil along the lower stream courses and in marshes and swamps elsewhere. Frequent or common.

Aster prenanthoides Muhl.

In moist gravelly soil of open woods along the stream courses and valleys. Common.

Aster tardiflorus L.

Moist soil along streams. Rare. Near Quaker Bridge.

Aster lateriflorus (L.) Britton.

In moist thickets, low open woods and banks chiefly the var. **hirsuticaulis** (Lindl.) Porter. Common.

Aster paniculatus Lam.

In moist or wet soil of open woods, thickets and often on dry banks. Common.

Aster Tradescanti L.

Usually distinguished from the preceding species by its much smaller flowers and more lax inflorescence. Common.

Aster salicifolius Lam.

Moist alluvial soil of open woods and thickets on the bottomlands. Infrequent.

Aster acuminatus Michx. Mountain Aster

In moist humus of the more fertile soils in the forested areas, sometimes on open banks. Common.

Aster umbellatus Mill. *Doellingeria umbellata* Nees. Flat-topped White Aster

In wet or moist soil, either stony, gravelly or sandy along the lower stream courses in open places and on the bottomlands of the Allegheny and Tunungwant valleys, where common.

ERIGERON ANNUUS (L.) Pers. Daisy Fleabane

In moist or dry places, often along streams and in waste places. Common.

Erigeron ramosus (Walt.) BSP. Daisy Fleabane

In situations similar to the preceding species but more abundant in the higher portions of the park and less so in the lower valleys.

Erigeron canadensis L. *Leptilon canadense* Britt. Horseweed

In moist or dry soil of open fields, roadsides and open woods. Common.

Sericocarpus asteroides (L.) BSP. White-topped Aster

In sandy or gravelly acid soil of the higher ridges and summits and on the bluffs and benches along the Allegheny valley. Infrequent. Elko mountain, Peters run, near Quaker Bridge, benches and banks near Red House etc.

Antennaria canadensis Greene. Pussy's Toes, Ladies' Tobacco

On moist gravelly banks near Buffalo camp on Quaker run.

Although several species of Antennaria were found in the park area and the immediate adjacent region, they can not be regarded as common species, and in fact as to individual numbers they must be reckoned among the rare plants of the park. There are locally a very few exceptions to this statement.

Northward and westward where the glaciated region begins they are more abundant both as to species and individuals.

Antennaria neodioica Greene.

In gravelly and stony soil of open woods on Seneca mountain, and in sterile soil of open places in a few other localities.

Antennaria occidentalis Greene.

In moist soil of abandoned, tree-grown field in Red House valley and in open woods on Pine hill.

Antennaria fallax Greene.

Gravelly banks and slopes near Cold Spring. Collected at Carrollton by Peck.

Antennaria Parlinii Fernald.

Sandy banks opposite Red House, in soil undoubtedly acid.

Anaphalis margaritacea (L.) B. & H. Pearly Everlasting

In gravelly, sterile or acid soil along the higher ridges on the conglomerate formation, and occasionally elsewhere in open places often on more fertile soils.

Gnaphalium obtusifolium L. *G. polycephalum* Michx. Everlasting

In gravelly or sandy sterile or acid soil. Infrequent on the conglomerate formation of the higher ridges, and rare on the Allegheny bottomlands.

Gnaphalium decurrens Ives, *G. Macounii* Greene. Decurrent Everlasting

In sandy soil of open places along the bottomlands. Rare. Quaker Bridge, Tunasassa etc.

Gnaphalium uliginosum L. Low Cudweed

In moist open places along Bee Hunter creek. Common. Locally common or frequent elsewhere in ditches and along streams.

INULA HELENIUM L. Elecampane

Roadsides and fields near Randolph.

AMBROSIA TRIFIDA L. Great Ragweed

Moist alluvial soil along the Allegheny river and in neglected fields of the bottomlands. Frequent.

AMBROSIA ARTEMISIIFOLIA L. Common Ragweed

A frequent weed along the railroads and in waste soil about Salamanca.

Heliopsis helianthoides (L.) Sweet. Ox-eye

In moist alluvial soil and gravelly banks along the Allegheny and Tunungwant valleys. Common.

RUDBECKIA HIRTA L. Black-eyed Susan

A common weed in the less fertile soils of fields and roadsides, often in open woods. Perhaps once native in this region, but now appearing like other introduced weed species.

Rudbeckia laciniata L. Cone-flower

In gravelly or alluvial wet soil along the lower stream courses, in open places, thickets and open woods. Frequent.

Helianthus divaricatus L. Wild Sunflower

In rocky, gravelly or sandy soil of open banks, bluffs, thickets and open woods, and hence chiefly common along the Allegheny valley and adjacent slopes; elsewhere infrequent or rare.

Helianthus strumosus L. Wild Sunflower

In moist open places along the lower and larger valleys. Frequent.

Helianthus decapetalus L. Wild Sunflower

Alluvial thickets. Rare. Near Elko and doubtless elsewhere.

HELIANTHUS TUBEROSUS L. Jerusalem Artichoke

Roadside and fields in fertile soil. Rare. Elko.

Bidens cernua L. Nodding Bur-Marigold

In wet soil along streams in the park area, where rare, frequently in wet roadside ditches, but more abundant around the acid bogs of the edge of the glacial drift near Randolph and Steamburg.

Bidens vulgata Greene.

In moist, usually fertile soil of waste places. Infrequent. Elko, Sunfish run etc.

Bidens frondosa L. Beggar's Ticks

In moist or low ground of waste places. Frequent on the bottomlands.

Helenium autumnale L. Sneezeweed

In wet soil along streams. Infrequent. Limestone in the Tunungwant valley, along Red House creek.

ACHILLEA MILLEFOLIUM L. Common Yarrow

Frequent in the poorer soils of the conglomerate formation on the higher ridges and elsewhere in dry soil of open woods and fields.

ANTHEMIS COTULA L. *Marata Cotula* DC. May-weed, Dog Fennel

A weed of neglected farmyards, etc. Quaker Bridge.

CHRYSANTHEMUM LEUCANTHEMUM L. White Daisy

A weed of fields, meadows and roadsides. Frequent.

TANACETUM VULGARE L. Tansy

About sites of former dwellings and along roadsides. Infrequent.

ARTEMISIA BIENNIS Willd. Wormwood

Spreading from former cultivation near Elko.

TUSSILAGO FARFARA L. Coltsfoot

Moist soil on banks and along cinder banks of railroads, occasional in the Allegheny valley and spreading.

Erechtites hieracifolia (L.) Raf. Fireweed

In sterile or even rather fertile soil of thickets and openings, usually most abundant where fire has followed lumbering or woodcutting operations.

Cacalia suaveolens L. Indian Plantain

In moist, fertile, alluvial soil of open places and thickets along the bottomlands of the Allegheny river. Scarce. Salamanca.

Cacalia atriplicifolia L. Pale Indian Plantain

In sterile, sandy or gravelly soil along the bottomlands of the Allegheny river. Frequent. Very conspicuous in late summer along the road between Quaker Bridge and Red House, near Carrollton etc.

Senecio obovatus Muhl. Round-leaved Squaw-weed

On stony and gravelly banks in fertile humus of open woods. Infrequent. Slide Hollow on Quaker run.

Senecio aureus L. Golden Ragwort

In wet gravelly or stony soil along stream courses either in shaded or open places, or in boggy meadows and marshes. Common.

ARCTIUM MINUS (Hill) Bernh. Smaller, or Common Burdock

Along roadsides, in waste soil and open thickets and woods. Frequent.

CIRSIUM LANCEOLATUM (L.) Hill. Bull Thistle

In dry pastures, fields, roadsides and open woods. Rare in the park area but frequent in the adjacent and less forested region. Frank W. Johnson reports **Cirsium odoratum** (Muhl.) Britt., from Quaker run in August 1921.

Cirsium muticum Michx. Swamp Thistle

In wet or springy soil in open places along the lower stream courses and especialy in open places in wooded swamps on the bottomlands of the Allegheny river.

CIRSIUM ARVENSE (L.) Scop. Canada Thistle

In waste places, cultivated soil and old fields. Frequent in the lower valleys and more common in the less wooded region adjacent to the park area.

CICHORIUM INTYBUS L. Chicory

Along railroads and occasional in waste ground elsewhere.

TRAGOPOGON PRATENSIS L. Goat's Beard

Roadside and railroad banks near Red House, doubtless elsewhere.

TRAGOPOGON PORRIFOLIUS L. Salsify. Oyster Plant

"Firmly established on bank of the railroad, one-half to one mile west of Salamanca, June 24, 1864 and 1865." (G. W. Clinton, Herbarium, N. Y. State Museum). Opportunity was not found to ascertain if the plant still persists there.

LEONTODON TARAXACUM L. *Taraxacum officinale* Weber. Common Dandelion

A common weed in fields and along roadsides.

SONCHUS ASPER (L.) Hill. Spiny-leaved Sow Thistle

A weed in fertile soil. Infrequent. Quaker Bridge.

SONCHUS OLERACEUS L. Common Sow Thistle

A weed along railroads and in waste soil. Infrequent.

LACTUCA SCARIOLA L. (*L. virosa* L.) Prickly Lettuce

An occasional weed in waste places and along railroads, only the var. INTEGRATA Gren. & Godr. seen.

Lactuca canadensis L. Wild Lettuce

In poor or somewhat fertile soil in open places. Frequent, in the park area and more abundant on the bottomlands of the larger valleys. The var. **integrifolia** (Bigel.) Gray, along English run.

Lactuca spicata (Lam.) Hitch. Blue Lettuce

In moist, usually fertile soil of open woods, thickets and banks or along roadsides. Common.

Prenanthes alba L. *Nabalus albus* Hook. Rattlesnake Root, White Lettuce, Lion's Foot

Collected on stony banks in open woods near Carrollton, by Peck, and occasional throughout the Allegheny valley.

Prenanthes trifoliata (Cass.) Fernald. Rattlesnake Root, Gall-of-the-earth

In moist soil in open woods, on banks and along roadsides. Common and extremely variable as to leaf outline.

Prenanthes altissima L. Rattlesnake Root

In moist fertile soil of open rocky or gravelly woods and banks. Occasional at Elko, Quaker Bridge etc.

HIERACIUM AURANTIACUM L. Orange Hawkweed, Devil's Paint Brush

Infrequent within the park area but more abundant in sandy soil along the edge of the glacial drift north and west of the park.

HIERACIUM FLORENTINUM All. King Devil

In sandy and gravelly sterile soil along the Allegheny bottomlands. Occasional. Rare on the conglomerate soils of the higher ridges. This and the preceding species are recent introductions and will probably increase greatly in abundance upon the poorer soils.

Hieracium venosum L. Rattlesnake-weed

In sterile gravelly, sandy and stony soil. Rare. Huckleberry hill, slopes of Elko mountain etc.

Hieracium Greenii Porter & Britton.

In rocky soil of open woods at Olean Rock City east of the park area. Not previously reported from New York State.

Hieracium paniculatum L. Panicled Hawkweed

In dry or rarely moist open woods and thickets, and banks. Frequent. Most abundant in sterile soils.

Hieracium scabrum Michx. Rough Hawkweed

In sterile or acid gravelly or sandy soil of open woods and banks. Common. Sometimes in moist, somewhat fertile situations.

Hieracium canadense Michx. Canada Hawkweed

In dry sandy or gravelly soil of banks and thickets or open woods chiefly along the Allegheny bottomlands. Frequent. Near Elko, Quaker Bridge, Red House etc. Occasional on the conglomerate formation of the higher ridges.

VEGETATION OF SELECTED EXCURSION ROUTES

In order to make this handbook of the flora of the Allegany Park region more generally useful to those who may be interested in the development of the vegetation of the area, there are added a number of sections describing rather briefly the main characteristics of the flora of certain selected areas of limited extent and of certain trails, or stream courses. These localities may be easily located by reference to the cover map.

This phase of the work might be carried to almost unlimited size, and the selection of the areas for detailed description can not coincide in all cases with those areas most suitable for local studies in geology and zoology. The reader will observe the general similarity between the vegetation of Elko mountain and Huckleberry hill. From this it is evident that other localities along the east side of the Allegheny valley with similar exposure and soil conditions will have a strikingly similar flora. A similar comparison can be made of the vegetation of the Stony run trail and the vegetation along the trail from Streamside to the "Rocks" above Buffalo camp. These two examples are typical for the character of the vegetation apt to be found elsewhere on similar slopes. The more critical student, however, will quickly discover that there are other areas of limited extent which would make equally interesting fields for a study of local vegetation, and it is to be hoped that the examples of this sort which are given in the following pages will stimulate a detailed study of many additional areas than here presented.

The local areas covered by the following sections are arranged in the following order:

1 Glacial moraine bogs
2 Allegheny river valley
   a Vegetation of the higher benches
   b Vegetation of the lower benches
   c Alluvial banks of the Allegheny river
   d Bayou or "ox-bow" near Cold Spring
   e Railroad embankments
3 Tunungwant valley
4 Balsam swamp in Red House valley
5 Huckleberry hill
6 River bluffs toward Elko
7 Elko mountain
8 Quaker run (Streamside vegetation)
9 Stony run trail
10 Streamside trail to the "rocks"
11 Slide hollow
12 Blacksnake mountain
13 Bradford road near state line
14 "Big Basin," or headwaters of Stoddard brook.
15 Headwaters of Red House creek.
16 The Salamanca "Rock City"

1 Glacial Moraine Bogs

About two miles north of Steamburg, near the southern edge of the terminal moraine deposits are to be found the only acid bogs and inclosed ponds typical of much of the glaciated region across New York State. The bog and pond near Steamburg are the nearest to the park area and are the only ones considered in this survey, although they lie outside the park region proper. The pond is known as Red pond, and the bog, perhaps a couple of acres in extent, we have designated as Keith's bog, from the name of the present owner of the farm upon which it is situated.

Except that the borders of the pond possess a dense growth of *Decodon verticilatus,* and that *Brasenia schreberi* is found on the surface of the water, the vegetation of the pond borders and Keith's bog are very much the same. As in all such bogs the prevailing ground cover is sphagnum moss.

Trees

Picea mariana
Larix laricina
Pinus Strobus
Abies balsamea
Acer rubrum
Betula lutea
Tsuga canadensis
Fraxinus nigra

Shrubs

Chamaedaphne calyculata
Aronia melanocarpa
Vaccinium corymbosum
Ilex verticillata
Decodon verticillatus
Nemopanthes mucronata
Vaccinium atrococcum
Gaylussacia baccata
Vaccinium canadense
Rubus hispidus
Acer spicatum
Benzoin aestivale
Salix Bebbiana
Rhus Vernix
Gaultheria procumbens
Salix lucida

Herbaceous

Osmunda cinnamonea
Juncus effusus
Thelypteris palustris
Carex canescens
Drosera rotundifolia
Iris versicolor
Carex leptalea
" incomperta
" lurida
" scoparia
Scirpus cyperinus
Lycopus uniflorus
Typha latifolia
Carex trisperma
" folliculata
Glyceria grandis
Carex intumescens
Aster umbellatus
Thelypteris cristata
Menyanthes trifoliata
Rynchospora alba
Bartonia virginica
Ludvigia palustris
Pogonia ophioglossoides
Sarracenia purpurea
Eleocharis palustris
Osmunda regalis
Galium Claytoni
Eriophorum virginianum
Aster puniceus
Galium tinctorium
Scutellaria lateriflora
Hypericum virginicum
Mimulus ringens
Habenaria clavellata
Caltha palustris
Geum rivale
Vaccinium Oxycoccus
Chiogenes hispidula
Dulichium arundinaceum
Eleocharis obtusa
Senecio aureus
Viola pallens
Solidago patula
Epilobium densum
Calla palustris
Polygonum sagittatum

(Photo by Buffalo Society of Natural Sciences)

Figure 26 Allegheny river valley near Elko

2 Allegheny River Valley

(Figure 26)

The bottomlands of the Allegheny valley offer a wide variety of studies in plant associations. There is a limited number of trees, shrubs and herbaceous plants which are common to the entire region and which may be found both in the Allegheny valley and in the uplands of the park area, but in general the flora of the valley is in striking contrast to that of the higher valleys and slopes.

During the glacial period or toward its close, an immense quantity of material, chiefly gravels and sands, evidently also some clay, was washed into the valley from the southern edge of the glacial ice, which formed an irregular semicircle around the northern edge of the present valley. The depth of this deposit is unknown, but certainly extends well below the present level of the river. Since the close of the glacial period the Allegheny river has cut its channel through this material to a depth of 25 to 50 feet, leaving much of the deposit in the form of terraces or benches of various levels. The highest benches are against the sides of the valley and the soil conditions on them is of the most sterile and acid nature to be found in the region. While mostly very dry there are places where some moisture seeps up through the deposits.

The lower terraces are more moist, and in some places where the surface is not well drained, very swampy woods occur. In other places there has been in times of very high water a deposition of some alluvial material by the river. These areas support a luxuriant thicket vegetation. Along the lowest levels there are occasionally found old channels of the river which have been cut off from the main stream and remain more or less filled with water forming bayous, as at Cold Spring.

At the openings of small branch valleys, the higher benches, if not eroded away at such places in past time by the main river, have been considerably cut down by the branch streams, which in some cases have also overlaid the glacial deposits with more recent and fertile deposits brought down from the Chemung shales higher up. The greatest extent of the higher terraces of benches are to be found on the west side of the valley between Quaker Bridge and Onoville, and northward, opposite Red House.

a **Vegetation of the higher benches.** The character of the glacial material forming these benches or terraces precludes the formation thereon of anything but the most sterile soil, which in most places is now highly acid in nature. Whether such was always the case is uncertain, since the nature of the primeval growth on these terraces is rather uncertain, although it is said to have been chiefly White Pine. An occasional White Pine is even now to be found on them.

There is an abundance of arborescent species on the higher benches but on account of frequent fires the growth can hardly be dignified under the name of a forest. It is chiefly dwarfed and stunted, bushlike or shrublike in nature with an occasional spot where the growth has become treelike or with scattered trees. The character of this vegetation is expressed by the following lists of species.

Trees (mostly small)

Quercus alba
" rubra
Populus grandidentata
" tremuloides
Carya glabra
Sassafras officinale
Cornus florida
Quercus velutina
Castanea dentata
Amelanchier canadensis
Crataegus Boyntoni
Prunus pennsylvanica
Acer saccharum
Nyssa sylvatica
Prunus virginiana
Fraxinus americana
Pinus Strobus

Shrubs

Corylus americana
Rubus flagellaris
Salix Bebbiana
Myrica asplenifolia
Gaylussacia baccata
Ceanothus americanus
Salix humilis
Cornus caudidissima
Vaccinium stamineum
Diervilla Lonicera
Rhus typhina
Vaccinium pennsylvanicum
Salix discolor
Hamamelis virginiana
Amelanchier intermedia
Rubus allegheniensis
Rhus glabra
Cornus alternifolia
Viburnum acerifolium
Rubus strigosus
Vitis aestivalis (vine)
Gaultheria procumbens
Lonicera dioica & var. glaucescens
Acer spicatum

Herbaceous

Pteridium latiusculum
Dennstaedtia punctilobula
Equisetum hyemale
Lycopodium clavatum
Panicum dichotomum
" **linearifolium**
Oryzopsis asperifolia
Agrostis alba
" perennans
Danthonia spicata
Poa pratensis
Agropyron caninum
Carex brachyglossa
" cephalophora
" pennsylvanica
Juncus tenuis
Luzula campestris var. **intermedia**
Uvularia sessilifolia
Lilium philadelphicum
Sisyrinchium gramineum
Comandra umbellata
Rumex Acetosella
Polygonum cilinode
Aquilegia canadensis
Silene stellata
Cimicifuga racemosa
Anemone virginiana
Clematis virginiana
Gillenia trifoliata
Potentilla canadensis
Baptisia tinctoria
Desmodium nudiflorum
" **rotundifolium**
" **bracteosum**
" **paniculatum**
Lespedeza hirta
Geranium maculatum
Polygala paucifolia
" verticillata
Hypericum perforatum
Oenothera perennis
Zizia cordata
Angelica villosa
Lysimachia quadrifolia
Apocynum androsaemifolium
Asclepias phytolaccoides
Convolvulus spithamaeus
Monarda fistulosa
Clinopodium vulgare
Scrophularia lanceolata
Aureolaria virginica
" glauca
Pedicularis canadensis
Melampyrum lineare
Conopholis americana
Galium lanceolatum
" circaezans
Lobelia spicata
Solidago bicolor
" caesia
" **juncea**
" arguta
" **rugosa**

Solidago graminifolia
Aster macrophyllus
" undulatus
" laevis
Erigeron canadensis
Sericocarpus asteroides
Antennaria neodioica
" fallax
Antennaria Parlinii
Anaphalis margaritacea
Helianthus divaricatus
Cacalia atriplicifolia
Hieracium florentinum
" scabrum
" canadense

b **Vegetation of the lower benches.** On the one hand, the vegetation of the lower benches merges in many places into the alluvial thicket type of the immediate river banks and alluvial bottoms, and on the other hand, into the type of vegetation found on the higher benches or along the abrupt slopes and bluffs of the sides of the valley. In some places, however, the transition is more abrupt. These lower benches might be regarded as the only bottomland of the valley. In general they are more moist and in some places they are decidedly wet, especially where low and undrained, such as the swampy woods along the Steamburg road just beyond Quaker Bridge, the swampy woods across the Quaker Bridge and south of the road which crosses the valley from east to west, near Cold Spring, Onoville Station and elsewhere. In these situations fires are almost impossible and the arborescent vegetation, where it has not been cut down, has made a good development, although there are few large trees of any species.

Trees

Acer rubrum
Salix nigra
Ulmus americana
Tilia americana
Fraxinus americana
Carpinus caroliniana
Juglans cinerea
Carya cordiformis
Populus grandidentata
Sassafras officinale
Quercus alba
Magnolia acuminata
Amelanchier canadensis
Acer saccharum
Prunus americana
Fraxinus nigra
Ulmus fulva
Crataegus, sp.
Carya glabra
Prunus pennsylvanica
" serotina
Acer saccharinum
Quercus rubra

Shrubs

Cornus candidissima
Ribes americana
Corylus cornuta
Alnus incana
Aronia melanocarpa
Ilex verticillata
Salix Bebbiana
" sericea
" discolor
Rubus pergratus
Viburnum dentatum
Corylus americana
Cornus Amomum
Salix lucida
Malus glaucescens
Viburnum Opulus
" Lentago
Sambucus canadensis
Prunus virginiana
Rubus allegheniensis
Hamamelis virginiana
Rosa carolina
Rhus typhina
Taxus canadensis
Rosa obovata
Amelanchier intermedia
Rhus copallina

Vines

Psédera quinquefolia
Rhus Toxicodendron
Smilax hispida
Celastrus scandens
Menispermum canadense
Vitis vulpina
Solanum Dulcamara

Herbaceous

Onoclea sensibilis
Thelypteris cristata
" spinulosa var. intermedia
Athyrium angustum
Pteridium latiusculum
Osmunda regalis
" **Claytoniana**
" **cinnamonea**
Botrychium virginianum
Equisetum sylvaticum
Panicum clandestinum
Agrostis perennans
Holcus lanatus
Danthonia compressa
" **spicata**
Poa palustris
Glyceria grandis
Festuca elatior
Elymus virginicus
Cyperus strigosus
Carex cephalophora
" **intumescens**
" **lupulina**
" **scoparia**
" **stipata**
" **tribuloides**
Carex trichocarpa
" Tuckermani
" **vulpinoidea**
Juncus effusus
" **tenuis**
Luzula campestris var. multiflora
Veratrum viride
Lilium canadense
Smilacina racemosa
Polygonatum pubescens
Trillium undulatum
Dioscorea villosa (vine)
Sisyrinchium gramineum
Humulus Lupulus (vine)
Urtica gracilis
Polygonum pennsylvanicum
" sagittatum
Ranunculus recurvatus
Thalictrum polygamum
Anemone canadense
" quinquefolia
Clematis virginiana (vine)
Barbarea vulgaris
Cardamine bulbosa
" **pennsylvanica**
Mitella diphylla

Geum strictum
Agrimonia gryposepala
Desmodium grandiflorum
" rotundifolium
" **paniculatum**
" **canadense**
Lespedeza hirta
Amphicarpa monoica
Geranium maculatum
Polygala verticillata
Hypericum punctatum
Hypericum ellipticum
Viola cucullata
" sororia
Oenothera muricata
" **biennis**
" tetragona
" perennis
Aralia nudicaulis
Sanicula marilandica
" gregaria
Cryptotaenia canadensis
Zizia cordata
Thaspium barbinode
Angelica atropurpurea
Heracleum lanatum
Lysimachia quadrifolia
Steironema ciliatum
Gentiana Andrewsii
Apocynum androsaemifolium
Asclepias syriaca
Convolvulus Sepium
Polemonium reptans
Phlox divaricata
Myosotis scorpioides
Verbena urticaefolia
" hastata
Teucrium canadense
Agastache scrophulariaefolia
Stachys tenuifolia var. **aspera**
Monarda didyma
" **clinopodia**
" fistulosa var. rubra
Clinopodium vulgare
Mentha arvensis var. canadensis
" piperita
Verbascum Thapsus
" Blattaria
Veronica virginica
Houstonia caerulea
Galium asprellum
" palustre
Triosteum perfoliatum var. aurantiacum
Lobelia siphilitica
Eupatorium maculatum
" purpureum
" perfoliatum
Solidago bicolor
" **juncea**
" **arguta**
" **rugosa**
" **serotina**
" **altissima**
" **graminifolia**
Aster undulatus
" **laevis**
" **lateriflorus**
" **paniculatus**
" **umbellatus**
Erigeron annuus
Gnaphalium decurrens
Rudbeckia hirta
Senecio aureus
Cirsium lanceolatum
Lactuca canadensis

c **Alluvial banks of the Allegheny river.** The arborescent vegetation along the banks of the river, where there is any such considerable growth, is of about the same composition as found in the low or wet portions of the bottomlands elsewhere. The relative order of abundance, however, is quite different if only the immediate banks are considered. The most conspicuous tree, although

not very common, is the Sycamore, *Platanus occidentalis,* and in sequence may be found Black Willow, *Salix nigra;* Red Maple, *Acer rubrum;* American Ash, *Fraxinus americana;* American Elm, *Ulmus americana;* Basswood, *Tilia americana* and Silver Maple, *Acer saccharinum.*

A characteristic feature of the alluvial soils along the river are dense thickets of Plum, *Prunus americana;* Nannyberry, *Viburnum Lentago,* and Choke Cherry, *Prunus virginiana,* all to be classed here as shrubs. With them are numerous smaller thickets or individuals of *Cornus candidissima, Corylus cornuta, Alnus incana, Salix sericea, Sambucus canadensis, Salix discolor,* and scattering numbers of several other shrubs which prefer such soil conditions.

As stated in the remarks regarding the vegetation of the lower benches of the valley, there is usually a gradual transition from the lower benches into the more fertile and more moist alluvial soil of the immediate river banks. As indicated in the two preceding paragraphs, certain arborescent and shrubby species are very characteristic of the river banks. The following list contains the most abundant herbaceous species, the more important ones being indicated by heavy type.

Pteritis nodulosa
Onoclea sensibilis
Athyrium angustum
Osmunda Claytoniana
" cinnamonea
Panicum clandestinum
Milium effusum
Calamagrostis canadensis
Bromus purgans
" altissimus
Elymus australis
" virginicus
Scirpus polyphyllus
Carex crinita
" **intumescens**
" Emoryi
" **scabrata**
Veratrum viride
Lilium superbum
" canadense
Smilacina stellata
Polygonatum giganteum
Smilax herbacea
Iris versicolor
Habenaria psycodes
Laportea canadensis

Urtica gracilis
Boehmeria cylindrica
Polygonum virginianum
Ranunculus abortivus
" pennsylvanicus
" **recurvatus**
" septentrionalis
Thalictrum polygamum
Clematis virginiana
Sanguinaria canadensis
Roripa palustris
Cardamine bulbosa
" **pennsylvanica**
Geum canadense
" virginianum
" **strictum**
Agrimonia gryposepala
Desmodium canadense
Apios tuberosa
Geranium maculatum
Impatiens biflora
Hypericum Ascyron
" punctatum
Viola cucullata
" sororia
Circaea latifolia
Sanicula gregaria
Sium suave
Cicuta maculata
Cryptotaenia canadensis
Lysimachia quadrifolia
" **terrestris**
Steironema ciliatum
Asclepias incarnata
Cynoglossum officinale
Lappula virginiana
Verbena urticaefolia
Teucrium canadense
Scutellaria galericulata
Stachys tenuifolia var. aspera
Monarda didyma
Lycopus americanus
Mentha piperita
Solanum Dulcamara
Mimulus ringens
Gratiola neglecta
Galium Aparine
" triflorum
" **asprellum**
Echinocystis lobata
Lobelia cardinalis
Eupatorium purpureum
Solidago serotina
Aster novae-angliae
" **puniceus**
" tardiflorus
" **lateriflorus**, var. **hirsuticaulis**
Aster salicifolius
Heliopsis helianthoides
Rudbeckia laciniata
Helianthus strumosus
" decapetalus
Bidens frondosa
Cacalia suaveolens
Cirsium muticum

d **Bayou or "ox-bow" near Cold Spring.** The arborescent and shrubby vegetation along the banks of this ox-bow is similar in most respects to that along the river banks, the soil in both cases being alluvial in nature. The principal tree is *Salix nigra* with a few scattering individuals of other bottomland species. Along the banks of the bayou are dense thickets of Plum, *Prunus americana;* Nannyberry, *Viburnum Lentago;* Panicled Dogwood, *Cornus candidissima;* Arrow-wood, *Viburnum dentatum;* Hazel, *Corylus cornuta* and some *C. americana;*

Choke Cherry, *Prunus virginiana* and Blackberry, *Rubus alleghaniensis; Salix sericea, Cornus Amomum, Psedera quinquefolia, Vitis vulpina* and *Alnus incana* are also frequent.

The principal herbaceous plants are those of the alluvial banks of the river, of which the following are most abundant although many others of that association may also be found here in lesser numbers. This list includes only the vegetation of the thickets along the banks of the bayou.

Pteritis nodulosa
Onoclea sensibilis
Panicum clandestinum
Bromus purgans
Calamagrostis canadensis
Elymus virginicus
Veratrum viride
Lilium canadense
Smilax herbacea
Urtica gracilis
Thalictrum polygamum
Clematis virginiana
Impatiens biflora
Verbena urticaefolia
Galium asprellum
Echinocystis lobata
Eupatorium purpureum
Solidago altissima
" rugosa
" serotina
Aster puniceus
" lateriflorus
Rudbeckia laciniata
Heliopsis helianthoides
Helianthus strumosus
Cirsium muticum

The bottom of the bayou is filled with shallow water over a particularly soft deep clayey mud and supports a very characteristic aquatic vegetation. Shrubs of *Cornus Amomum* and *Salix sericea* extend into the shallow water in places, but the Buttonbush, *Cephalanthus,* which was to be expected in this habitat, was absent. The shallow water supports a luxuriant growth of plants preferring muddy banks and quiet water, of which the most conspicuous species are as follows:

Scirpus cyperinus
" validus
Rumex verticillatus
Glyceria grandis
Eleocharis obtusa
Carex lacustris
Leersia oryzoides
Carex lupulina
Spirodela polyrhiza
Asclepias incarnata
Lycopus americanus
Veronica scutellata

Aster puniceus
Lemna minor
Juncus effusus
Iris versicolor
Sagittaria latifolia var. obtusa
Alisma Plantago-aquatica
Sparganium americanum
Polygonum Hydropiper
" coccineum
Carex vulpinoidea
Roripa palustris
Hypericum mutilum
Viola cucullata
Carex stipata
Cicuta maculata
Sium suave
Lysimachia terrestris
Carex lurida
Lycopus uniflorus
Ilysanthes dubia
Cicuta bulbifera

e **Railroad embankments.** The Pennsylvania Railroad from Onoville to Cold Spring is ballasted with broken or crushed slag and in some places with cinders. As in most sections of the State there is to be found along this stretch of track an interesting number of migratory plants, mostly from Europe, which have arrived by way of the railroad. A walk along the railroad from the vicinity of Quaker Bridge station to Cold Spring will reveal a fairly large number of these more recent additions to our flora, some of them scarcely more than adventive, others now well established in many places other than along the railroad. The following list includes only the species growing between the ties along the railroad or upon the sides of the slag and cinder ballast. A few native species seem to have found a favorable habitat here along with the migrant species and they are indicated by heavy face type. It is to be expected that other native species will also be found occasionally in such places but their number, like that of the adventive and naturalized species, varies with the degree of cleanliness maintained by the railroad. A more extended search of the railroads, especially about Salamanca, would doubtless yield a substantial addition to this list. *Allium canadense* was noted in cinders at Riverside Junction.

Equisetum arvense
" *hyemale*
Digitaria Ischaemum
" sanguinalis
Setaria lutescens
" viridis
Phleum pratense
Eragrostis peregrina
Lolium perenne
Agropyron repens
Rumex Acetosella
Polygonum erectum
" aviculare
" aviculare var. angustissimum
" Persicaria
" Convolvulus
Chenopodium Berlanderi
" leptophyllum
Mollugo verticillata
Cerastium vulgatum
Agrostemma Githago
Lychnis alba
Saponaria officinalis
Silene antirrhina
Lepidium densiflorum
" campestre
Capsella Bursa-pastoris
Thlaspi arvensis
Sisymbrium altissimum
Barbarea vulgaris
Sedum triphyllum
Rubus flagellaris
Medicago lupulina
Malilotus alba
Euphorbia hirsuta
" nutans
" maculata
Hypericum perforatum
Apocynum androsaemifolium
Asclepias syriaca
Lappula echinata
Symphytum officinale
Prunella vulgaris
Verbascum Blattaria
Linaria vulgaris
" minor
Plantago lanceolata
Erigeron annuus
Ambrosia artemisifolia
Tussilago Farfara
Cichorium Intybus
Tragopogon pratensis
Sonchus oleraceus
Lactuca scariola
Hieracium florentinum

The railroad has a nearly north and south direction from the state line north to Cold Spring and beyond. In most places the tracks follow rather closely the base of the adjacent slopes of the east side of the valley, and perhaps because the prevailing winds are from the west in addition to the fact that the east side of the right of way consists of numerous banks higher by several feet than the tracks, there has been deposited here during the many years since the railroad was constructed a layer of cinders which in many places is several inches in depth, and a distinct abundance of cinders can be found in many places from 25 to 50 feet away, on the east side of the tracks, depending upon the slope and presence or absence of trees thereon. The absence of most of the adventive or nat-

uralized species on these cinder deposits, species common along the adjacent tracks, seems to indicate that the cinders alone offer no special attraction to them and that their abundance on the tracks is more dependent upon some physical condition of the cinder and slag ballast. This may be the more recent and frequently disturbed surface between the tracks and along the sides of the tracks.

3 Tunungwant Valley

Between Limestone and the north end of the Tunungwant valley there is very little grade. In consequence there are several bayous or ox-bows of the Tunungwant creek north of Limestone and the general character of the bottomlands is swampy and lacking in the immense deposits of glacial material which characterizes the Allegheny valley between Salamanca and Onoville. It is possible that at least toward the close of the glacial period the northern end of the Tunungwant valley was closed by glacial débris and that a temporary lake was formed. Certainly the alluvial deposits north of Limestone consist of several feet of fine-mixed clay and sand, and in consequence the vegetation of this portion of the valley presents some marked differences from that of the Allegheny valley on the west side of the park area.

The character of the primeval forest in the Tunungwant valley can only be surmised, as all of the valley has been more or less cleared, and the present swamp forests are but remnants. Southward toward Bradford and on the drier portions of the valley, hickory is more abundant than anywhere else in this region, while toward the north end of the valley there are wooded swamps and open marshes of considerable extent.

Alluvial streamside vegetation. North of Limestone the bottomlands are largely neglected and uncultivated and along the banks of the "Tuna" creek, its branch streams, the bayous and depressions caused by former stream channels are to be found dense thickets of very rank herbaceous and woody vegetation. Some of them are almost impenetrable owing to the density, the size of the herbaceous vegetation and the interlacing growth of various vines. This association of plants is an excellent example of what our native vegetation can do if given a good opportunity.

The tree growth is naturally limited. These consist chiefly of Black Willow, *Salix nigra* (and the smaller *Salix cordata* and *Salix sericea*); Silver Maple, *Acer saccharinum;* and scattered trees of Elm, *Ulmus americana;* Sycamore, *Platanus occidentalis;* Box Elder, *Acer Negundo,* and Red Maple, *Acer rubrum.*

The shrubs are mainly the small willows, with Red-osier, *Cornus stolonifera;* Alder, *Alnus incana;* Hazel, *Corylus americana,* and some *C. cornuta;* Silky Dogwood, *Cornus Amomum;* Wild Black Currant, *Ribes americanum;* Panicled Dogwood, *Cornus candidissima;* Nannyberry, *Viburnum Lentago;* Elderberry, *Sambucus canadensis,* and Arrowwood, *Viburnum dentatum.* Occasionally the Blackberry, *Rubus allegheniensis* and the Raspberry, *Rubus strigosus* add to the impenetrability of the growth.

Among the vines, both woody and herbaceous, which serve to bind the arborescent and herbaceous vegetation into jungle like growths are:

Vitis aestivalis
Smilax hispida
Clematis virginiana
Humulus Lupulus
Apios tuberosa
Vitis vulpina
Psedera quinquefolia
Convolvulus Sepium
Rhus Toxicodendron
Solanum Dulcamara
Amphicarpa monoica
Smilax herbacea
Dioscorea villosa

The herbaceous vegetation is in most places particularly tall and dense, and almost everywhere except in the thickets and wet depressions consists mainly of goldenrods. The following list is not meant to be a complete list of the herbaceous species of the bottomlands but merely indicative of the character of the growth making up the major portion of the vegetation along the alluvial banks and depressions for a distance of perhaps a mile northward from Limestone. The predominating species are printed in heavy type.

Pteretis nodulosa
Onoclea sensibilis
Athyrium angustum
Osmunda cinnamonea
" Claytoniana
Panicum clandestinum
Leersia oryzoides
Bromus altissimus
Elymus virginicus
" australis
Carex lacustris
" **tribuloides**
" trichocarpa
" Tuckermani
" **vulpinoidea**
" **lurida**
" **lupulina**
Eleocharis palustris
Veratrum viride
Lilium canadense
Smilacina stellata
Iris versicolor
Laportea canadensis
Urtica gracilis
Thalictrum polygamum
Anemone canadensis
" **virginiana**
Geum strictum
Impatiens biflora
Pastinaca sativa
Heracleum lanatum
Steironema ciliatum
Verbena urticaefolia
Eupatorium maculatum
" **purpureum**
Solidago rugosa
" **serotina**
" **altissima**
" graminifolia
Aster puniceus
" lateriflorus
" **Tradescanti**
" salicifolius
" **umbellatus**
Rudbeckia laciniata
Helianthus strumosus
Heliopsis helianthoides
Ambrosia trifida
Helenium autumnale
Arctium minus
Cirsium muticum
Lactuca canadensis
" spicata
Bidens frondosa

Swamp forest. Toward the north end of the valley the wooded swamps consist mainly of the following:

Red Maple, *Acer rubrum*
Swamp Oak, *Quercus bicolor*
Elm, *Ulmus americana*
Black Ash, *Fraxinus nigra*
Black Gum, *Nyssa sylvatica*
Blue Beech, *Carpinus Caroliniana*
Sweet Birch, *Betula lenta*
Butternut, *Juglans cinerea*
Pignut, *Carya cordiformis*
Bassword, *Tilia americana*

(Photo by A. A. Saunders, Roosevelt Wild Life Station)

Figure 27 Cattail (*Typha latifolia*) marsh in the Tunungwant Valley

(Photo by A. A. Saunders, Roosevelt Wild Life Station)

Figure 28 Bayou in the Tunungwant Valley

In open marshy places and along the borders of some of the bayous are to be found extensive growths of cattail, *Typha latifolia* (figure 27) which is either absent in the Allegheny valley or so rare there as to escape notice. In the bayous (figure 28) is to be found a luxuriant growth of plants which prefer wet muddy soil or shallow water. The most important members of this growth are:

Onoclea sensibilis
Scirpus cyperinus
" pedicellatus
" **validus**
Osmunda regalis
Typha latifolia
Sparganium americanum
Alisma Plantago-aquatica
Sagittaria latifolia & var. **obtusa**
Leersia oryzoides
Calamagrostis canadensis
Cinna arundinacea
Glyceria grandis
Eleocharis palustris
" acicularis
Dulichium arundinaceum
Carex lacustris
" **lupulina**
" lurida
" stipata
Carex trichocarpa
Calla palustris
Lemna minor
Spirodela polyrhiza
Juncus effusus
" acuminatus
Iris versicolor
Rumex verticillatus
Polygonum hydropiperoides
" coccineum
Nymphaea advena
Caltha palustris
Roripa palustris
Impatiens biflora
Ludvigia palustris
Cicuta maculata
Sium suave
Asclepias incarnata
Lycopus americanus
Chelone glabra
Aster puniceus

4 Balsam Swamp in Red House Valley

In the lower part of the Red House valley and north of the highway is located the only growth of balsam, *Abies balsamea*, within the Allegany Park area. A few trees only remain of what must once have been a considerable swamp. Within this little remnant, however, the ground is heavily carpeted with sphagnum moss and contains in addition to the fir or balsam trees, which are mostly small in size, a number of other plants found nowhere else south of the big bend in the Allegany river encompassing the

park area upon three sides. The character of the flora of this small wooded swamp, which we have designated as "Balsam swamp," is quite suggestive of the vegetation of similar areas in the Adirondack region.

Trees

*Abies balsamea
Acer rubrum
Betula lutea
Tsuga canadensis
Amelanchier laevis
Fraxinus nigra

Shrubs

Aronia melanocarpa
*Viburnum cassinoides
*Vaccinium canadense
*Benzoin aestivale
Acer spicatum
Cornus Amomum
Gaultheria procumbens
*Salix pedicellaris
Ilex verticillata
Nemopanthes mucronata
Salix discolor
*Rubus hispidus
" pubescens
Sambucus racemosus

Herbaceous Plants

Onoclea sensibilis
*Thelypteris palustris
" cristata
Athyrium acrostichoides
" angustum
Osmunda regalis
" Claytoniana
" cinnamonea
Calamagrostis canadensis
Glyceria nervata
*Carex angustior
" bromoides
" Deweyana
* " folliculata
* " gynandra
" intumescens
" leptalea
" lupulina
" lurida
" radiata
" scoparia
" stipata
" trichocarpa
* " trisperma
Juncus effusus
*Cypripedium reginae
*Polygonum arifolium
*Arenaria lateriflora
Coptis trifolia
Saxifraga pennsylvanica
Cardamine pennsylvanica
Hypericum mutilum
Viola cucullata
Geum rivale
Dalibarda repens
*Epilobium densum
Cornus canadensis
*Chiogenes hispidula
Galium tinctorium
Lobelia siphilitica
Eupatorium perfoliatum
Solidago serotina
" patula
Aster puniceus
" Tradescanti
Senecio aureus
Cirsium muticum

The species marked with an asterisk (*) were not found elsewhere within the park area, although some of them were observed and collected in the bogs of the glaciated region a few miles northward near Steamburg and Randolph. It would add greatly to the botanical interest of the park area if this swamp and the adjacent land were speedily acquired by the State. The conditions are such that if properly protected, the swamp would increase in size, while on the other hand, many of the rare plants therein are on the verge of extinction if the small amount of arborescent cover now left should be removed or if the place should be opened for pasturage. A line fence is located close along the east side of the present swamp and east of this fence the swamp has been completely cleared away. There remains only the stumps and a marshy pasture of no value. This was evidently at one time an eastward extension of the balsam swamp.

5 Huckleberry Hill

Like nearly all of the prominent and rather steep slopes along the western edge of the park area and adjacent to the Allegheny river bottomlands, this hill has been entirely lumbered over in the past, and later subjected to repeated fires, some of them very recent. The total result on the present vegetation is most marked. Huckleberry hill is a part of the lower Chemung series of shales, and there is no reason for not believing that in primeval days it was covered with a dense forest composed chiefly of the hardwood species which prefer the west facing and drier slopes of the region, namely, oak, chestnut, maple, beech, cherry, ash etc.

Denuded of their primeval forests and subjected many times to fire, the slopes have lost most of their humus

and the increased sunlight to which the ground is subjected has retarded decomposition of the present litter and dried out the underlying soil and rock surfaces. As a result the soil conditions have become decidedly acid and the present vegetation undoubtedly markedly different in composition from that of primeval conditions.

Trees (most of them young)

Quercus rubra
" alba
Cornus florida
Fraxinus americana
Castanea dentata
Prunus serotina
Quercus velutina
Sassafras officinalis
Hamamelis virginiana
Populus tremuloides
Cornus alternifolia
Amelanchier intermedia
Magnolia acuminata
Prunus pennsylvanica
Populus grandidentata
Acer saccharum
Acer rubrum
Carpinus caroliniana

Shrubs

Vaccinium pennsylvanicum
Cornus rugosa
Diervilla Lonicera
Salix humilis
Corylus cornuta
Vaccinium vacillans
Viburnum acerifolium
Vaccinium stamineum
Azalea nudiflora
Rhus glabra
Salix Bebbiana
Gaultheria procumbens
Sambucus canadensis
Epigaea repens
Myrica asplenifolia
Rosa carolina
Salix tristis
Ceanothus americanus
Cornus alternifolia
Rubus strigosus
Rubus allegheniensis
Hamamelis virginiana
Rhus Toxicodendron

Herbaceous

Pteridium latiusculum
Lysimachia quadrifolia
Desmodium grandiflorum
Sanicula marilandica
Pyrola americana
Geranium maculatum
Lycopodium complanatum var. flabelliforme
" obscurum
Melampyrum lineare
Chamaelirium luteum
Clintonia umbellulata
Fragaria virginiana
Lilium philadelphicum
Hieracium venosum
Luzula campestris var. multiflora
Viola plamata (see p. 106)
Panicum dichotomum
Aquilegia canadensis
Potentilla canadensis
Lespedeza capitata
Apocynum androsimaefolium
Desmodium paniculatum
Carex pennsylvanica
Oryzopsis asperifolia

Panicum linearifolium
Epilobium angustifolium
Panicum dichotomum
Vicia caroliniana
Lespedeza intermedia
Uvularia perfoliata
Aster macrophyllus
Cypripedium acaule
Adiantum pedatum
Desmodium rotundifolium
Asclepias phytolaccoides
Dennstaedtia punctilobula
Solidago juncea
Thelypteris noveboracensis
Carex cephalophora
Juncus tenuis
Hepatica americana
Carex convoluta
Helianthus divaricatus
Spiranthes gracilis
Uvularia sessilifolia
Lycopodium clavatum
Agrostis perennans
Danthonia spicata
Epigaea repens
Aralia nudicaulis

6 River Bluffs on the Road to Elko

For a distance of about a mile approaching Elko, the highway is cut through the shoulders of several small bluffs of the lower Chemung shales. Below the highway the surface descends very steeply in some places to the railroad below, where numerous cuts were made in the shale in order to secure a straight right of way. In some places the river flows close to the base of these bluffs. Above the highway the slopes are rather steep and several rather deep ravines descend quite steeply toward the river. In such places the highway is carried over the ravines on high fills. These slopes have been for the most part burned over repeatedly since lumbering, and evidences of a fire in the spring of 1926 were very plain. The result is a very thin soil, in some places scarcely any soil over the shale. What soil there is supports a rather sparse flora of plants which prefer such exposed sterile situations.

On the shoulders of these bluffs the principal arborescent species are young growths of Sassafras, *Sassafras officinale;* Red Oak, *Quercus rubra;* Beech, *Fagus grandifolia;* White Oak, *Quercus alba;* Chestnut Oak, *Quercus montana;* Hop Hornbeam, *Ostrya virginiana;* Sweet Birch, *Betula lenta;* and on the bluffs below the road where

fire has not been so frequent, Hemlock, *Tsuga canadensis;* Sycamore, *Platanus occidentalis;* and Shadbush, *Amelanchier laevis* and *A. canadensis.*

These bluffs, however, are interesting chiefly for the character of the shrubby vegetation, the principal species being:

Cornus rugosa
Kalmia latifolia
Ceanothus americanus
Myrica asplenifolia
Rubus odoratus
Salix Bebbiana
Rubus occidentalis
Diervilla Lonicera
Salix humilis
Corylus cornuta
Sambucus racemosus
Viburnum acerifolium
Cornus alternifolia

In the small ravines the vegetation is for the most part fairly dense, and the soil apparently more fertile, so that the herbaceous vegetation possesses in these spots a composition similar to the slopes of Huckleberry hill. On the bluffs, however, we find in addition to the general run of plants which in this region prefer sterile or acid soils of open places, the following species in such abundance as to make the locality one of ecological interest, in which lumbering and repeated fires have played a major role:

Carex pennsylvanica
Poa palustris
Baptisia tinctoria
Panicum dichotomum
Melampyrum lineare
Aureolaria glauca
Panicum huachucae
Aster macrophyllus
Lysimachia quadrifolia
Danthonia spicata
Aralia racemosa
Juncus acuminatus
Pastinaca sativa
Clematis virginiana
Galium Claytoni
Scrophularia lanceolata
Solidago juncea
Desmodium bracteosum
Vicia caroliniana
Helianthus divaricatus
Aureolaria virginica
Solidago arguta

7 Elko Mountain

From near the outlet of Wolf run at Elko an indistinct trail leads up the northwest shoulder of Elko mountain to the summit. Lumbering and subsequent fire combined

with steepness of slope, which facilitates soil erosion after fire, have all contributed to the present character of the vegetation, a thin second-growth of trees and shrubs preferring sterile slopes. Hemlock is abundant only at the base of the mountain. From the north summit there is obtained a good view up the valley of Wolf run (figure 29). The slope on the west side toward the Allegheny river is particularly abrupt in many places. In the brook (Wolf run) at the base of the mountain is found a fine growth of *Callitriche heterophylla,* with *Ludvigia palustris* and *Viola cucullata.* Several butternut trees flourish here and the Sundrops, *Oenothera perennis,* is very abundant.

There are few moist places on the slopes of the mountain except along the slope above Wolf run on the north side. The undergrowth on the mountainside contains some of the finest examples of the Black Snakeroot, *Cimicifuga racemosa,* to be found anywhere in this region. The Yellow Poplar, *Liriodendron tulipifera,* is also abundant here, but of course chiefly as saplings or young trees. The principal trees and shrubs of the slopes are given in about the order of their relative abundance although from place to place considerable variation may be found in this respect, while the principal herbaceous species are listed in systematic sequence, the most abundant ones in heavy type.

Trees (mostly young)

Tsuga canadensis
Acer saccharum
Quercus rubra
Tilia americana
Fraxinus americana
Quercus alba
Betula lenta
Fagus grandifolia
Populus grandidentata
Prunus serotina
Liriodendron Tulipifera
Betula lutea
Amelanchier canadensis
Populus tremuloides

(Photo by Buffalo Society of Natural Sciences)

Figure 29 View of Wolf run valley from Elko Mountain

Shrubs

Diervilla Lonicera
Rubus allegheniensis
Salix Bebbiana
Viburnum acerifolium
Cornus rugosa
Rubus strigosus
Vaccinium pennsylvanicum
Salix discolor
Azalea nudiflora
Rubus odoratus
Salix humilis
Cornus alternifolia
Gaultheria procumbens
Vaccinium stamineum
Rosa carolina var. glandulosa

Herbaceous Plants

Thelypteris noveboracensis
" marginalis
Polystichum acrostichoides
Dennstaedtia punctilobula
Pterilium latiusculum
Botrychium ramosum
Osmunda Claytoniana
Lycopodium clavatum
Panicum huachucae
" linearifolium
Oryzopsis asperifolia
Agrostis perennans
Danthonia spicata
Bromus purgans
Hystrix patula
Carex cephalophora
" **communis**
" **convoluta**
" pennsylvanica
" **digitalis**
" platyphylla
" **heterosperma**
" laxiculmis
Luzula saltuensis
Uvularia sessilifolia
Lilium philadelphicum
Clintonia umbellulata
Cypripedium parviflorum var. pubescens
" acaule
Habenaria orbiculata
Spiranthes gracilis
Polygonum cilinode
Arenaria lateriflora
Aquilegia canadensis
Thalictrum dioicum
Hepatica americana
Cimicifuga racemosa
Waldsteinia fragarioides
Desmodium grandiflorum
" rotundifolium
Lespedeza intermedia
Geranium maculatum
Polygala paucifolia
Viola palmata (see p. 106)
" **canadensis**
" **rostrata**
Epilobium angustifolium
Sanicula marilandica
Monotropa uniflora
Chimaphila umbellata
Pyrola secunda
" elliptica
" **americana**
Lysimachia quadrifolia
Apocynum androsaemifolium
Prunella vulgaris
Lycopus americanus
Veronica officinalis
" serpyllifolia
Aureolaria virginica
" glauca
Melampyrum lineare
Houstonia caerulea
Eupatorium falcatum
" urticaefolium
Solidago caesia
" **flexicaulis**
" arguta
" **rugosa**
" graminifolia var. Nuttallii
Aster divaricatus
" Schreberi
" **macrophyllus**
" **cordifolius**

Sericocarpus asteroides
Anaphalis margaritacea
Erechtites hieracifolia
Hieracium venosum
" paniculatum
" canadense
" scabrum

On the gravelly bars of the Allegheny river at the outlet of Wolf run, near the base of the mountain, occurs a fine growth of the Swamp Milkweed, *Asclepias incarnata;* Indian Hemp, *Apocynum cannabinum;* Monkey Flower, *Mimulus ringens;* and the rare *Carex Emoryi* while the Black Willow, *Salix nigra,* is everywhere common along the river here.

8 Quaker Run (Streamside Vegetation)

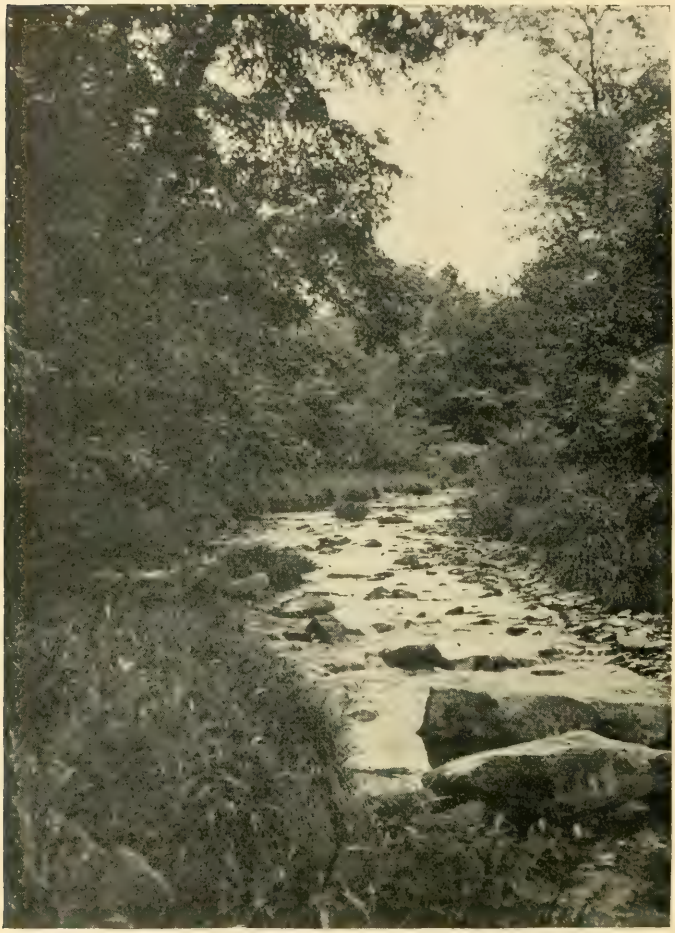
At times when the water is low it is possible to traverse much of the upper course of Quaker run from Stony creek downstream, either along the immediate bank or by way of the gravel bars of the stream. The character of the second growth arborescent vegetation in the bottom of the valley is visibly influenced by the stream only along its immediate banks where Willows, Red Maple, Elm, Mountain Maple and Alder constitute a dominant part in the streamside tree growth. Other trees of the valley however, are common along the banks, such as Hemlock, Black Cherry, Sugar Maple, Butternut, Blue Beech, Basswood, Ash, Aspens, and Fire or Bird Cherry.

The principal shrubs most closely associated with the banks of the stream are as follows:

Salix lucida
" Bebbiana
" cordata
" sericea
" discolor
Alnus incana
Hamamelis virginiana
Rubus allegheniensis
Acer spicatum
Sambucus canadensis
Diervilla Lonicera
Cornus Amomum
Spiraea alba
Rubus odoratus
" strigosus
Cornus alternifolia
Sambucus racemosus

The herbaceous species listed here are those which were seen by traversing the stream from near Stony brook (figure 30) to a point about a mile below Headquarters (Frecks) (figure 31), and do not include many of the common woodland species occurring back a little distance from the stream. The abundance of some of the streamside species is undoubtedly determined by the open character of certain stretches of the stream rather than by any marked influence of the stream itself. This is true of some of the species of Goldenrod, Aster, Sedges and Grasses. On the other hand, there are stretches of the stream where the unbroken forest ends abruptly beside the stream. The species which seem to be largely determined as regards abundance by the influence of the stream are printed in heavy type.

Onoclea sensibilis
Athyrium angustum
Osmunda Claytoniana
" **cinnamonea**
Equisetum sylvaticum
Panicum latifolium
Agrostis alba
Cinna latifolia
Glyceria nervata
" melicaria
Elymus riparius
Scirpus atrovirens
" polyphyllus
" cyperinus
Carex crinita
" gracillima
" intumescens
" **lurida**
" prasina
" projecta
" **scabrata**
" scoparia
" **stipata**
" **torta**
Juncus effusus
Veratrum viride
Lilium canadense
Smilax herbacea
Iris versicolor
Habenaria psycodes
" fimbriata
Laportea canadensis
Boehmeria cylindrica
Polygonum Hydropiper
" virginianum
" sagittatum
Stellaria graminea
Ranunculus abortivus
" recurvatus
Thalictrum dioicum
" **polygamum**
Actaea alba
Clematis virginiana
Roripa palustris
Barbarea vulgaris
Cardamine pennsylvanica
Saxifraga pennsylvanica
Chrysosplenium americanum
Geum canadense
" virginianum
Agrimonia gryposepala
Amphicarpa monoica



(Photo by the Buffalo Society of Natural Sciences)

Figure 30 View along Quaker run near Stony creek

(Photo by the Buffalo Society of Natural Sciences)

Figure 31 View along Quaker run below Freeks

Callitriche heterophylla
Impatiens pallida
" biflora
Hypericum punctatum
Viola cucullata
" pallens
" striata
Ludvigia palustris
Circaea alpina
Sanicula marilandica
Hydrocotyle americana
Cryptotaenia canadensis
Lysimachia terrestris
Steironema ciliatum
Myosotis laxa
Verbena urticaefolia
Scutellaria lateriflora
Monarda didyma
Lycopus uniflorus
" americanus
Chelone glabra
Mimulus ringens
Veronica americana
Galium asprellum
Houstonia caerulea
Eupatorium maculatum
" **perfoliatum**
" urticaefolium
Solidago caesia
" rugosa
" serotina
" arguta
" altissima
Aster puniceus
" prenanthoides
" laterifolius
" **umbellatus**
Rudbeckia laciniata
Helianthus strumosus
Senecio aureus

9 Stony Brook Trail

The trail up Stony brook to the summit of the ridge near Bay State road offers perhaps the best and most varied cross section of the flora of the entire park area. Beginning on Quaker run (figure 32), where in former times White Pine occurred in some abundance on the lower slopes, we find the deep ravine of the lower part of Stony brook covered with a dense vegetation of the second growth forest. Here neither the soil nor its humus have suffered so intensely from fire and the effects of leaching, and in consequence the soil is fairly fertile and somewhat calcareous in nature.

By an easy grade the trail ascends upward, crossing several attractive branch brooks and springs, where the wet soil supports a most varied flora of the plants which prefer rather open wet or springy places. These spots are interspersed with stretches of drier slopes covered with second growth forest. The trail finally emerges into an old clearing, the location of a former lumber camp, in

(Photo by the Buffalo Society of Natural Sciences)

Figure 32 View of Quaker run valley at Frecks

which the vegetation consists chiefly of grasses, sedges, berry bushes, goldenrods, asters and clumps of various shrubs and tall herbaceous plants. In late summer the ubiquous goldenrods usurp the place. There are several wet, almost boggy springy spots here which invite a brief stop for the study of the vegetation. One of the spots contains quite an abundance of Sphagnum and one looks for the Sundew, but in vain.

Beyond the clearing the trail soon enters a wooded area of a different type from that on the slopes below. Here the underlying rock formation is Olean conglomerate and the resultant soils are more sterile or acid. The forest, also of second growth, contains more oak, chestnut and sassafras than is found in the forest below, and at the summit is found the climax of this condition.

Lower Part of Stony Brook Trail

Trees

Acer saccharum
Tilia americana
Fraxinus americana
Prunus serotina
Fagus grandifolia
Betula lenta
Tsuga canadensis
Carpinus caroliniana
Prunus pennsylvanica
Acer pennsylvanicum
Magnolia acuminata
Populus grandidentata
Betula lutea
Acer rubrum
Castanea dentata
Quercus rubra
Populus tremuloides

Shrubs

Lonicera canadensis
Viburnum acerifolium
Ribes Cynosbati
Sambucus racemosus
Rubus allegheniensis
Diervilla Lonicera
Salix lucida
Salix sericea
" discolor
Amelanchier laevis
Salix Bebbiana
Rubus strigosus
Cornus Amomum
Sambucus canadensis

Herbaceous

Thelypteris spinulosa var. **intermedia**
Polypodium virginianum
Lycopodium lucidulum
" annotinum
Panicum dichotomum
" **huachucae**
Brachyelytrum erectum
Milium effusum
Cinna latifolia
Poa saltuensis
Glyceria nervata
" melicaria
Festuca nutans
Bromus ciliatus
Scirpus atrovirens var. georgianus
Carex aestivalis
" Baileyi
" **communis**
" **flexuosa**
" gracillima
" **leptonervia**
" **normalis**
" prasina
" **projecta**
" scabrata
" sparganioides
Arisaema triphyllum
Juncus tenuis
Luzula campestris var. multiflora
Uvularia perfoliata
Allium tricoccum
Erythronium americanum
Clintonia borealis
Smilacina racemosa
Maianthemum canadense
Disporum lanuginosum
Streptopus roseus
Medeola virginiana
Trillium erectum
Corallorrhiza maculata
Laportea canadensis
Asarum reflexum
Claytonia caroliniana
Ranunculus abortivus
" septentrionalis
Thalictrum polygamum
Anemone virginiana
Actaea alba
Hepatica acutiloba
Podophyllum peltatum
Caulophyllum thalictroides
Dicentra canadensis
Dentaria laciniata
Cardamine pennsylvanica
Tiarella cordifolia
Mitella diphylla
Fragaria virginiana
Geum canadense
Geum rivale
Dalibarda repens
Agrimonia gryposepala
Oxalis europea
" Acetosella
Geranium maculatum
Impatiens biflora
Hypericum perforatum
Viola septentrionalis
" **rotundifolia**
" **incognita**
" **pubescens**
" **eriocarpa**
" **canadensis**
" **conspersa**
" rostrata
Circaea latifolia
Aralia nudicaulis
Sanicula marilandica
" trifoliata
Osmorrhiza Claytoni
Cryptotaenia canadensis
Monotropa uniflora
Pyrola elliptica
Steironema ciliatum
Trientalis borealis
Apocynum androsaemifolium
Hydrophyllum virginianum
" canadense
Cynoglossum boreale
Prunella vulgaris
Monarda didyma
Lycopus uniflorus
" americanus
Collinsonia canadensis

Chelone glabra
Veronica americana
" officinalis
Pedicularis canadensis
Epifagus virginiana
Galium lanceolatum
" **circaezans**
" **triflorum**
Mitchella repens
Lobelia inflata
Eupatorium maculatum
" **urticaefolium**
Solidago caesia
" flexicaulis
Aster divaricatus
" **cordifolius**
" prenanthoides
" paniculatus
" **acuminatus**
Erigeron ramosus
Antennaria neodioica
Senecio aureus
Lactuca spicata
Hieracium paniculatum

Upper Part of the Stony Brook Trail

Above the old clearing on the Stony brook trail the character of the vegetation undergoes a marked change as compared with that on the lower slopes. In addition to the difference in the nature of the underlying rock, which in this region influences greatly the character of the soil, fire following the lumbering operations seems to have wrought a more complete destruction of the primeval vegetation, and the gradual evolution of the vegetation on these upper slopes back to a climax forest typical for the region and soil will be interesting to observe and make the subject of future records. The attainment of such a growth will undoubtedly take a long time, but records of its developmental changes should be kept by frequent surveys. The characteristic vegetation of the lower slopes below the clearing is here gradually, in some places rather abruptly, surplanted by a vegetation preferring more sterile or acid soil conditions, due in large measure to the fact that the underlying formation is Olean conglomerate. Increased exposure of the forest floor to intense sunlight following lumbering, and the leaching effect of heavy rainfall have also contributed to the increased sterility of the litter on the ground. The characteristic species of the ridge and adjacent slopes are:

Trees

Castanea dentata
Fagus grandifolia
Populus tremuloides
Acer rubrum
Quercus rubra
Prunus pennsylvanica
Quercus alba
Populus grandidentata
Acer saccharum
Magnolia acuminata
Sassafras officinale
Acer pennsylvanicum
Prunus serotina
Amelanchier canadensis
Cornus florida
Betula lutea

Shrubs

Vaccinium pennsylvanicum
Azalea nudiflora
Viburnum acerifolium
Diervilla Lonicera
Rubus allegheniensis
Rhus glabra
Cornus rugosa
Gaylussacia baccata
Salix Bebbiana
Gaultheria procumbens
Rhus typhina
Salix discolor
Ribes Cynosbati
Rubus strigosus
Hamamelis virginiana
Amelanchier intermedia
Cornus alternifolia

Herbaceous

Because of the varying abundance of the elements of the herbaceous vegetation from place to place even along the fairly uniform soils of the ridge, the herbaceous species of particular abundance or importance on the ridge are listed in systematic sequence.

Thelypteris noveboracensis
Dennstaedtia punctilobula
Pteridium latiusculum
Botrychium angustisegmentum
Lycopodium clavatum
" obscurum
" **tristachyum**
Panicum dichotomum
Oryzopsis asperifolia
Danthonia spicata
" compressa
Festuca nutans
Agrostis hyemalis
Carex communis
" **convoluta**
" Deweyana
" **foenea**
" pennsylvanica
Juncus tenuis
Luzula saltuensis
" campestris var. multiflora
Uvularia sessilifolia
Maianthemum canadense
Cypripedium acaule
Habenaria Hookeriana
Spiranthes gracilis
Microstylis unifolia
Smilacina racemosa
Anemone quinquefolia
Lespedeza intermedia
Geranium maculatum
Polygala paucifolia
Viola palmata (see p. 106)
Epilobium angustifolium
Viola pubescens

Aralia hispida
Sanicula trifoliata
Chimaphila umbellata
Pyrola secunda
Epigaea repens
Lysimachia quadrifolia
Veronica officinalis
Pedicularis canadensis
Mitchella repens
Solidago hispida
Aster macrophyllus
Antennaria neodioica
Anaphalis margaritacea
Hieracium scabrum
" canadense

10 Streamside Trail to the "Rocks"

A path along Quaker run from near the swimming pool up to the vicinity of "slide hollow" is known as the streamside trail. From the vicinity of Buffalo camp and "Slide hollow" paths ascend to a broken ledge of large rocks on the slope above, perhaps 400 feet above the bottom of Quaker run valley at this place. The forest of the slope is very similar to the growth along the lower part of the Stony brook trail, which is less than a mile to the eastward. This second growth consists chiefly of:

Sugar Maple, *Acer saccharum*
Basswood, *Tilia americana*
White Ash, *Fraxinus americana*
Black Cherry, *Prunus serotina*
Beech, *Fagus grandifolia*
Yellow Birch, *Betula lutea*
Bird Cherry, *Prunus pennsylvanica*
Striped Maple, *Acer pennsylvanicum*
Cucumber-Tree, *Magnolia acuminata*
Large-toothed Aspen, *Populus grandidentata*
Shad Bush, *Amelanchier laevis*
Sweet Birch, *Betula lenta*
Red Maple, *Acer rubrum*
Hemlock, *Tsuga canadensis*
Hop Hornbeam, *Ostrya virginiana*
Chestnut, *Castanea dentata*
Sassafras, *Sassafras officinale*

Above the rocks the proportion of hemlock increases and Beech, Maple, Black Cherry, Basswood and Birch occupy the dominant positions as timber trees. The shrubs and herbaceous vegetation are also similar to that along the Stony brook trail, but the second growth and transitory nature of the forest makes exact comparisons

difficult. Around the rocks is found the Five-leaved Ivy, *Psedera quinquefolia*. The most abundant shrubs are:

Viburnum acerifolium
Diervilla Lonicera
Hamamelis virginiana
Rubus allegheniensis
Ribes Cynosbati
Sambucus racemosus
Rubus strigosus
Lonicera canadensis
Salix Bebbiana
Salix discolor

The variations in soil moisture, amount of humus and exposure to sunlight from place to place on the slope give a wide variety of herbaceous plants, so much so that any attempt to list them in the order of relative abundance would probably result in quite different lists if made by different observers. Presented in systematic sequence the characteristic herbaceous plants of the slope are as follows:

Botrychium virginianum
Lycopodium obscurum
Panicum dichotomum
Milium effusum
Brachyelytrum erectum
Agrostis hyemalis
Cinna latifolia
Melica striata
Danthonia spicata
Glyceria melicaria
Festuca nutans
Bromus ciliatus
Hystrix patula
Carex aestivalis
" **communis**
" flexuosa
" **gracillima**
" Deweyana
" laxiculmis
" **leptonervia**
" **normalis**
" plantaginea
Arisaema triphyllum
Juncus tenuis
Luzula campestris var. multiflora
Uvularia sessilifolia
Allium tricoccum
Clintonia borealis
Smilacina racemosa
Maianthemum canadense
Disporum lanuginosum
Streptopus roseus
Medeola virginiana
Trillium undulatum
Trillium erectum
Corallorrhiza maculata
Asarum reflexum
Polygonum cilinode
Claytonia caroliniana
Coptis trifolia
Actaea alba
Hepatica acutiloba
Caulophyllum thalictroides
Dicentra Cucullaria
Mitella diphylla
Tiarella cordifolia
Waldsteinia fragarioides
Dentaria diphylla
Geum canadense
Dalibarda repens

Agrimonia gryposepala
Oxalis Acetosella
Geranium maculatum
Viola septentrionalis
" rotundifolia
" Selkirkii
" **incognita**
" blanda
" **pubescens**
" **eriocarpa**
" **canadensis**
" **conspersa**
" rostrata
Aralia nudicaulis
Sanicula marilandica
" trifoliata
Osmorrhiza Claytoni
Cryptotaenia canadensis
Trientalis borealis
Cynoglossum boreale
Prunella vulgaris
Collinsonia canadensis
Veronica officinalis
Galium triflorum
Mitchella repens
Solidago caesia
" flexicaulis
" rugosa
Aster divaricatus
" cordifolius
Lactuca spicata

11 Slide Hollow

The semicircular hollow along the upper part of the streamside trail just above Buffalo camp may have had its origin from a slip of the adjacent slopes, but there is not much definite evidence of any such origin at the present time. Botanically the spot is interesting because in spite of the early lumbering operations and even recent clearing for firewood and camp sites, it possesses a rich, fertile soil, probably in greater part obtained from the leaching out of the most fertile elements of the soils on the slopes above. Quaker run seems to have meandered over a part of the hollow at one time so that there is some swampy and poorly drained soil. The adjacent slopes are heavily wooded with second growth forest upon a soil which in places is deep, fertile and mellow. There is in consequence a rich and varied flora, particularly of those species which prefer fertile calcareous soils. The arborescent flora is not greatly different from that of the slopes above but the relative abundance of certain elements is somewhat different.

Trees

Acer rubrum
Prunus serotina
Tsuga canadensis
Betula lutea
Acer saccharum
Carpinus caroliniana
Fagus grandifolia
Ulmus americana
Tilia americana
Populus tremuloides
Amelanchier canadensis
Magnolia acuminata

Shrubs

Hamamelis virginiana
Rubus odoratus
" strigosus
Ribes prostratum
Sambucus canadensis
Viburnum alnifolium
Salix discolor
Lonicera canadensis
Cornus Amomum
Salix Bebbiana

Herbaceous (Systematic sequence)

Onoclea sensibilis
Thelypteris marginalis
" **spinulosa** var. **intermedia**
Athyrium acrostichoides
" **angustum**
Adiantum pedatum
Botrychium virginianum
Panicum huachucae
Milium effusum
Brachyelytrum erectum
Agrostis perennans
Poa saltuensis
Glyceria nervata
" **melicaria**
Bromus purgans
" **ciliatus**
Elymus riparius
Hystrix patula
Scirpus atrovirens
Carex Deweyana
" flexuosa
" **gracillima**
" leptonervia
" **prasina**
" rosea
" **scabrata**
" stipata
Arisaema triphyllum
Luzula saltuensis
Uvularia sessilifolia
" **perfoliata**
Allium tricoccum
Erythronium americanum
Clintonia borealis
Smilacina racemosa
Maianthemum canadense
Streptopus roseus
Trillium grandiflorum
Orchis spectabilis
Habernaria psycodes
Laportea canadensis
Asarum reflexum
Claytonia caroliniana
Aquilegia canadensis
Ranunculus abortivus
" recurvatus
Thalictrum dioicum
Anemone quinquefolia
Actaea alba
Hepatica acutiloba
Podophyllum peltatum
Caulophyllum thalictroides
Dicentra Cucullaria
Dicentra canadensis
Dentaria diphylla
Cardamine pennsylvanica
Saxifraga pennsylvanica
Tiarella cordifolia
Mitella diphylla
Waldsteinia fragarioides
Geum canadense
" virginianum
Oxalis Acetosella

Impatiens pallida
Hypericum punctatum
Viola cucullata
" sororia
" **incognita**
" blanda
" rotundifolia
" **pubescens**
" **eriocarpa**
" **canadensis**
" rostrata
Circaea latifolia
Panax trifolium
Sanicula marilandica
" gregaria
Hydrocotyle americana
Osmorrhiza Claytoni
Cryptotaenia canadensis
Steironema ciliatum
Trientalis borealis
Phlox divaricata
Hydrophyllum virginianum
" **canadense**
Lappula virginiana
Prunella vulgaris
Monarda didyma
Lycopus uniflorus
" americanus
Chelone glabra
Pedicularis canadensis
Epifagus virginiana
Galium triflorum
Mitchella repens
Eupatorium maculatum
" **urticaefolium**
Solidago **caesia**
" **flexicaulis**
Aster **divaricatus**
" **cordifolius**
" macrophyllus
" **prenanthoides**
" acuminatus
Senecio obovatus

12 Blacksnake Mountain

From the site of the school and reservoir on upper Quaker run there is an old railroad grade leading around the west face of Blacksnake mountain and up the south slope, finally extending beyond the state line into Pennsylvania. The site of the school is on the Chemung shale but not far below the Olean conglomerate, so that the course of the trail soon traverses a region of sterile acid soils similar to those found on the higher ridges of the park area. Near the school site the most fertile soil of the slopes supports a rich and varied flora. The forest is mainly second growth, although a few crooked or otherwise undesirable trees of the older growth have been left by the lumbering operations. This trail is interesting chiefly for the spot designated as "club-moss cut" a short distance up the grade where it cuts through a small shoulder of rock and dirt in rounding a curve onto the

south side of the mountain. On this bank are found four species of Lycopodium: *L. annotinum; L. clavatum; L. complanatum* var. *flabelliforme,* and *L. tristachyum.* Here also is a fine growth of *Rubus odoratus.*

The forest before reaching the cut contains more Hemlock, Sugar Maple, Sweet Birch, Yellow Birch and Beech than the slopes on the north side of Quaker run, but otherwise the composition of the growth is about the same. The ground is carpeted with *Viola incognita, Dalibarda repens, Mitchella repens, Oxalis Acetosella, Galium triflorum, Carex Deweyana, Fragaria virginiana, Carex communis, Thelypteris noveboracensis, Dennstaedtia punctilobula, Aster prenanthoides, Asarum reflexum, Glyceria nervata, Ranunculus recurvatus, Glyceria elongata, Lycopodium lucidulum, Tiarella cordifolia, Uvularia sessilifolia, Coptis trifolia, Viola rotundifolia, Brachyleytrum erectum, Waldsteinia, Trillium, Podophyllum, Festuca nutans,* and many other species common in the fertile woodlands of this region.

Farther along the trail beyond the "club-moss cut" the poorer soil conditions overlying the conglomerate formation support a type of vegetation common on similar soils throughout the park, as on the summit of the Stony creek trail, and the Bradford road near the state line. *Azalea nudiflora* is more abundant here than elsewhere, and in open places may be found a number of rather rare plants not usually so closely associated elsewhere in this region. They are as follows:

Thelypteris hexagonoptera
Carex virescens
Galium lanceolatum
Spiranthes gracilis
Microstylis unifolia
Botrychium angustisegmentum
Danthonia spicata
Scirpus atrovirens var. georgianus
Clintonia umbellulata
Cimicifuga racemosa
Carex digitalis

13 Bradford Road Near the State Line

Some of the highest elevations of the park area are to be found some distance east of where the road to Bradford crosses the state line into Pennsylvania. The slopes are rather steep on the south side of the ridge and are covered with a second growth which in places is considerably older than the second growth forest of Quaker run valley. The tree species are chiefly Sugar Maple, Hemlock, Ash, Yellow Birch, Red Maple, Red Oak, with numerous examples of Aspen, Bird Cherry and Shadbush. The Mountain Ash, *Sorbus americana,* occurs near the top of the ridge, where also is found the Flowering Dogwood, *Cornus florida,* and the Sassafras.

The shrubs listed here are those occurring chiefly near the top of the ridge and hence on the poor or sterile gravelly soil derived from the conglomerate formation:

Salix Bebbiana
Diervilla Lonicera
Viburnum acerifolium
Salix discolor
Rubus allegheniensis
Gaultheria procumbens
Ribes Cynosbati
Cornus rugosa
Rubus strigosus
Cornus canadensis
Acer pennsylvanicum
Amelanchier intermedia
Ilex monticola
Azalea nudiflora
Lonicera dioica var. glaucescens
Rubus hispidus

During the latter part of July 1926, the display of Fireweed, *Epilobium angustifolium,* along the freshly disturbed banks of the road approaching the summit from Quaker run was the finest ever seen by the authors outside of the Adirondack region.

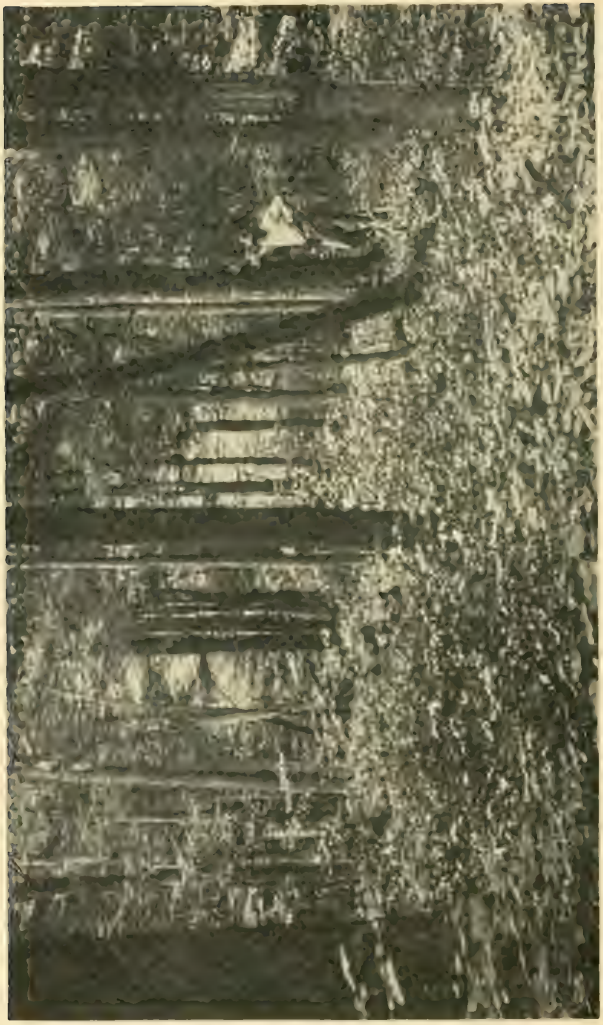
Owing to repeated fires which have devastated this portion of the park in recent years, the following list of herbaceous species not only is smaller than the number to be found on similar soils of the summit of Stony creek

trail and other ridges on the conglomerate formation, but shows in a measure the effect of fire in altering the relative abundance of species upon a given area. The most abundant species are indicated in heavy type.

Dennstaedtia punctilobula
Pteridium latiusculum
Osmunda cinnamonea
Botrychium obliquum
Lycopodium clavatum
" **complanatum** var. **flabelliforme**
Panicum dichotomum
" huachucae
Oryzopsis asperifolia
Agrostis alba
" **hyemalis**
Glyceria nervata
Danthonia spicata
Bromus ciliatus
Carex cephalophora
" **convoluta**
" pallescens
" **foenea**
" **radiata**
" virescens
" **lurida**
" **scoparia**
" Baileyi
" **digitalis**
Juncus tenuis
Uvularia sessilifolia
Maianthemum canadense
Disporum lanuginosum
Spiranthes gracilis
Microstylis unifolia
Rumex Acetosella
Polygonum cilinode
Phytolacca americana
Aquilegia canadensis
Coptis trifolia
Anemone quinquefolia
Waldsteinia fragarioides
Potentilla canadensis
Geranium maculatum
Polygala paucifolia
Hypericum perforatum
Viola rostrata
Epilobium angustifolium
Aralia hispida
Sanicula marilandica
Chimaphila umbellata
Pyrola secunda
" **americana**
Lysimachia quadrifolia
Trientalis borealis
Apocynum androsaemifolium
Prunella vulgaris
Melampyrum lineare
Galium circaezans
Solidago caesia
" **juncea**
" arguta
" **rugosa**
" altissima
" **graminifolia** var. **Nuttallii**
Aster macrophyllus
" **umbellatus**
Erigeron ramosus
Anaphalis margaritacea
Rudbeckia hirta
Achillea Millefolium
Erechtites hieracifolia
Lactuca spicata
Hieracium paniculatum
" **scabrum**
" canadense

14 "Big Basin," or Headwaters of Stoddard Brook

The "big basin" or "big timber," as it is locally designated, is located around the small headwaters of Stoddard brook, which is best reached from the summit on Bay



(Photo by H. R. Francis, N. Y. State College of Forestry)

Figure 33 View in the mixed forest of hardwoods and hemlock on the headwaters of Stoddard brook, the "Big Basin"

State road, although the woods can also be entered from Red House along up Stoddard brook. The summits of the ridges surrounding the basin are of the Olean conglomerate and the soils where exposed are gravelly and sterile. This character shows most plainly close to the Bay State road. The Olean formation extends down some distance into the basin area before the Chemung shales are encountered, but the soil conditions in the semiprimeval timber even on the Olean are fairly fertile owing to the small amount of lumbering and fire and the undisturbed condition of the deep humus. The forest (figure 33) is predominately hardwood in composition, but Hemlock is one of the two or three most abundant trees on all slopes, and especially on the slopes facing north or east, while on the slopes facing west it is exceeded in abundance by some of the hardwood species. The principal trees of this area are:

Acer saccharum
Tsuga canadensis
Fagus grandifolia
Tilia americana
Prunus serotina
Betula lenta
Fraxinus americana
Betula lutea
Acer rubrum
Magnolia acuminata
Quercus rubra
Ostrya virginiana
Carpinus caroliniana
Cornus florida
Liriodendron Tulipifera
Ulmus americana

In many places, owing to the dense shade of the forest and the small amount of lumbering and subsequent fire, the shrubby undergrowth is rather thin, sometimes almost negligible, and consists chiefly of the following species:

Viburnum alnifolium
" acerifolium
Sambucus canadensis
Taxus canadensis
Acer pennsylvanicum
Cornus alternifolia
Hamamelis virginiana
Acer spicatum
Gaultheria procumbens
Ribes Cynosbati
Lonicera canadensis
Sambucus racemosus
Salix Bebbiana
" discolor
Rubus odoratus
Diervilla Lonicera
Rubus strigosus
Ilex monticola
Evonymus obovatus (very rare)

The herbaceous plants of the woods undoubtedly present to us the best illustration within the park area of the general character of the growth upon the forest floor in the primeval forests of this region. The list of species encountered during a single excursion through the woods of the "big basin" is arranged in systematic sequence, with the most abundant species printed in heavy type. The numerous small brooks with their moist or wet depressions alternating with drier shoulders of the surrounding slopes produces localized colonies of plants the composition of which would demand more detailed treatment than space permits here.

Onoclea sensibilis
Thelypteris noveboracensis
" **spinulosa** var. **intermedia**
" Goldiana
Polystichum acrostichoides
Dennstaedtia punctilobula
Athyrium acrostichoides
" **angustum**
Adiantum pedatum
Osmunda Claytoniana
Botrychium obliquum
" **virginianum**
Lycopodium **lucidulum**
" clavatum
" obscurum
Panicum huachucae
Brachyelytrum erectum
Agrostis hyemalis
" **perennans**
Cinna latifolia
Poa saltuensis
Glyceria nervata
" melicaria
Festuca nutans
Bromus ciliatus
Hystrix patula
Scirpus polyphyllus
Carex Baileyi
" **bromoides**
" cephaloidea
Carex **communis**
" Deweyana
" **digitalis**
" gracillima
" **leptonervia**
" prasina
" **projecta**
" **scabrata**
" stipata
Arisaema triphyllum
Juncus tenuis
Veratrum viride
Uvularia perfoliata
Allium tricoccum
Clintonia borealis
Smilacina racemosa
Maianthemum canadense
Disporum lanuginosum
Streptopus roseus
Medeola virginiana
Trillium erectum
" grandiflorum
" undulatum
Cypripedium acaule
Orchis spectabilis
Habenaria psycodes
Corallorrhiza maculata
Laportea canadensis
Asarum reflexum
Claytonia caroliniana
Coptis trifolia

Ranunculus recurvatus
Actaea alba
Hepatica acutiloba
Cimicifuga racemosa
Podophyllum peltatum
Caulophyllum thalictroides
Dicentra canadensis
Dentaria diphylla
Cardamine pennsylvanica
Tiarella cordifolia
Mitella diphylla
Chrysosplenium americanum
Waldsteinia fragarioides
Geum canadense
Oxalis Acetosella
Geranium maculatum
Impatiens biflora
Circaea alpina
" **latifolia**
Aralia nudicaulis
" racemosa
Viola septentrionalis
" **rotundifolia**
" **incognita**
" **blanda**
" pallens
" pubescens
" **eriocarpa**
" **canadensis**
" conspersa
Panax quinquefolium
" trifolium
Sanicula marilandica
" trifoliata
Osmorrhiza Claytoni
Cryptotaenia canadensis
Monotropa uniflora
Pyrola secunda
" elliptica
Epigaea repens
Trientalis borealis
Hydrophyllum virginianum
" **canadense**
Prunella vulgaris
Collinsonia canadensis
Chelone glabra
Veronica americana
" officinalis
Epifagus virginiana
Galium triflorum
" circaezans
Mitchella repens
Eupatorium urticaefolium
Solidago altissima
" **caesia**
Aster divaricatus
" macrophyllus
" **cordifolius**
" acuminatus
Lactuca spicata
Hieracium paniculatum
" scabrum
Prenanthes albus

15 Headwaters of Red House Creek

Along the upper portion of Red House creek, above the cleared sections, is located a considerable area of "tall timber," a growth which in some places is certainly of semi-primeval character, and in which evidences of extensive lumbering and fire are not conspicuous. This area is located chiefly above the place designated on the maps as "Halls." The forest growth consists of about the same elements as are found in the "big basin" around the headwaters of Stoddard brook, and some fine examples of the typical forest trees of the region are to be found

here. The bulk of the forest is composed of Sugar Maple, *Acer saccharum;* Hemlock, *Tsuga canadensis;* Beech, *Fagus grandifolia* and Basswood, *Tilia americana,* although several additional species of trees occur in some abundance. Logging of Hemlock has apparently reduced the abundance of this tree considerably.

In the most dense portions of this limited area of large timber, especially in the moist soil along the streams the undergrowth is limited to a few very characteristic shrubs such as Hobblebush, *Viburnum alnifolium;* Skunk Currant, *Ribes prostratum;* Fly Honeysuckle, *Lonicera canadensis;* American Yew, *Taxus canadensis,* and a few others.

Of the herbaceous plants of the forest floor, out of a very large number of species, many of them the same as may be found on the headwaters of Stoddard brook, it seems necessary to mention only a few of the most abundant:

Oxalis Acetosella
Dalibarda repens
Dryopteris spinulosa var. intermedia
Mitchella repens
Clintonia borealis
Maianthemum canadense
Lycopodium lucidulum
Viola incognita
" rotundifolia
Disporum lanuginosum
Habenaria orbiculata
Monotropa uniflora
Viola blanda
Pyrola elliptica
Carex leptonervia
Circaea alpina
Carex projecta
Trillium undulatum
Carex gracillima
Alsine uliginosa (in brook)
Arisaema triphyllum
Allium tricoccum
Vagnera racemosa
Trientalis borealis
Streptopus roseus
Asarum canadense
Actaea alba

16 The Salamanca "Rock City"

The immediate vicinity of the geologically famous "Rock City" which is located about four miles north of Salamanca, has been entirely lumbered during the past two

or three years. While this serves to bring out in stronger relief the bold appearance of the gigantic slabs of rock, the native vegetation has been largely destroyed or vastly altered. At the time of this survey fire had not as yet invaded the litter upon the ground and the deep and rather fertile humus, although located upon the Olean formation, gives promise of a luxuriant second growth. If, however, fire invades this area most of this humus will be destroyed and conditions will prevail similar to those existing upon most of the higher ridges of the park area.

Just above the level of the "Rock City" occurs a fine forest of semiprimeval character, chiefly hardwoods, in which the following species predominate:

Fagus grandifolia	Betula lenta
Tsuga canadensis	Castanea dentata
Acer saccharum	Quercus rubra
Betula lutea	Acer rubrum
Prunus serotina	Fraxinus americana
Tilia americana	Magnolia acuminata

With these characteristic trees are several species of minor importance such as:

Ulmus americana	Prunus pennsylvanica
Populus grandidentata	Amelanchier laevis
" tremuloides	Sorbus americana
Ostrya virginiana	Cornus florida

The undergrowth of large and small shrubs is particularly dense and luxuriant, and several of them are almost treelike in size, especially the following:

Acer spicatum	Ilex monticola
Salix Bebbiana	Hamamelis virginiana
Acer pennsylvanicum	Amelanchier canadensis

The smaller shrubs, abundant especially on and about the rocks, are:

Viburnum alnifolium
Taxus canadensis
Lonicera dioica
Vaccinium pennsylvanicum
Rubus odoratus
Sambucus racemosus
Gaylussacia baccata
Ribes Cynosbati
Nemopanthes mucronata
Sambucus canadensis
Cornus rugosa
Diervilla Lonicera
Viburnum acerifolium
Evonymus obovatus

The following list of herbaceous plants found on and about the rocks is not meant to be a complete list of all of the species to be found here, but indicates in a general way the character of the flora. The most abundant species are indicated by heavy type.

Cystopteris fragilis
Thelypteris spinulosa
" marginalis
Pteridium latiusculum
Polypodium virginianum
Lycopodium lucidulum
" **clavatum**
" obscurum
Panicum huachucae
Oryzopsis asperifolia
Agrostis perennans
Danthonia spicata
Melica striata
Carex Baileyi
" **brunnescens**
" Deweyana
" **flexuosa**
" **projecta**
Luzula saltuensis
Uvularia sessilifolia
Clintonia borealis
Smilacina racemosa
Maianthemum canadense
Streptopus roseus
Disporum lanuginosum
Trillium undulatum
Pilea pumila
Polygonum cilinode
Arenaria lateriflora
Coptis trifolia
Thalictrum dioicum
Actaea alba
Cimicifuga racemosa
Mitella diphylla
Tiarella cordifolia
Waldsteinia fragarioides
Dalibarda repens
Oxalis Acetosella
Viola septentrionalis
" rostrata
Epilobium angustifolium
Cornus canadensis
Viola rotundifolia
Trientalis borealis
Hydrophyllum virginianum
" canadense
Galium lanceolatum
" **circaezans**
" **triflorum**
Mitchella repens
Eupatorium urticaefolium
Solidago flexicaulis
" **caesia**
Aster divaricatus
" **macrophyllus**
" cordifolius
" **prenanthoides**
" **acuminatus**
" umbellatus
Erigeron canadense
Anaphalis margaritacea
Gnaphalium obtusifolium
Erechtites hieracifolia
Prenanthes trifoliata
Hieracium paniculatum

STATISTICS OF THE FLORA

The systematic distribution of the native and introduced species and varieties in this flora may be tabulated as follows:

	Native		*Introduced*	
	species	*varieties*	*species*	*varieties*
Pteridophyta	38	4	....	....
Spermatophyta				
Gymnospermae	7	....	....	....
Angiospermae				
Monocotyledoneae ..	163	5	20	....
Dicotyledoneae				
Choripetalae	270	13	63	2
Gamopetalae	187	12	48	....
	665	34	131	2

The total number of species, both native and introduced, is 796.

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Figure 34 Map of Allegany State Park and Vicinity

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