

Arboretum news. Volume 7 1958

University of Wisconsin--Madison. Arboretum
Madison, Wisconsin: University of Wisconsin-Madison Arboretum,
1958

<https://digital.library.wisc.edu/1711.dl/HODFQDQDDLIIJ8I>

<http://rightsstatements.org/vocab/InC/1.0/>

For information on re-use see:

<http://digital.library.wisc.edu/1711.dl/Copyright>

The libraries provide public access to a wide range of material, including online exhibits, digitized collections, archival finding aids, our catalog, online articles, and a growing range of materials in many media.

When possible, we provide rights information in catalog records, finding aids, and other metadata that accompanies collections or items. However, it is always the user's obligation to evaluate copyright and rights issues in light of their own use.



ARBORETUM NEWS

Vol. 7, No. 1

Madison, Wisconsin

January, 1958

The Finnerud Forest – A New Arboretum Responsibility

The University of Wisconsin Regents at their February 1, 1958 meeting accepted a conveyance of interest in the Finnerud property in Oneida County, near Minocqua, and adopted the following recommendation concerning this 300 acre forest: "That the administrative responsibility for the operation and management of the Finnerud property in Oneida County, Wisconsin, in which the University has an interest, be assigned to the Arboretum Committee of the University; and that this area, which is to be maintained in its natural state as a part of the Arboretum property of the University for experimental purposes in a way calculated to reasonably preserve native fauna, flora and other forms of life, be designated as "The Finnerud Forest of the University of Wisconsin." This area, which includes considerable lakeshore frontage, will be a highly valuable outdoor laboratory, offering conditions very different from those prevailing in the Arboretum at Madison.

Notes on 1957 Plantings

A list of 1957 plantings has been provided by Supt. Jacobson. Many additions were made to the shrub and herb plantings in the horticultural area near the headquarters and to the viburnum collection along Nakoma Road. Tree plantings were extended in the various woods and plantations and, due to favorable planting weather, success of most of the plantings of whatever nature was higher than usual in 1957, so far as we could judge. A total of approximately 5200 plantings was made, 4400 in the spring season. Some of the principal plantings were 1200 white pine, 1000 red pine, 500 jack pine, 529 white spruce, 25 black spruce, 362 sugar maples, 115 soft maples, 50 red maples, 160 white birch, 15 yellow birch, 100 beech, 141 American elm, 55 white ash, 39 thornless honeylocusts. Numerous single tree specimens of various horticultural varieties were set out, and many different shrubs were placed in the expanded small shrub plantings near the headquarters. The plants which Supt. Jacobson and Ed Cawley, Arboretum Botanist, gathered on their northern trip were listed in some detail in the October 1957 issue of the Arboretum News.

Problems in the Grady Track Oak Opening

That portion of the Grady Track which has been designated as Oak Opening presents some interesting problems not encountered elsewhere in the Arboretum. An oak opening, as the name suggests, is an area where the trees are widely scattered. Less than 50% of the ground is shaded and in consequence, in prairie regions such as much of the land south of Madison was in pre-settlement times, the understory vegetation consists largely of prairie plants. In nature an oak opening is maintained by fires which repeatedly burn over the prairie understory, but do not kill the mature trees. Oak openings are uncommon in southern Wisconsin now, but were the most common plant community at the time of settlement by white men. Indeed, one of the most spectacular changes in the landscape of southern Wisconsin in the last hundred years has been the conversion of oak openings to dense oak forests as the white settlers controlled the fires which were formerly very common.

One reason why this conversion to dense forest was so rapid was the presence in the understory of oak plants called "grubs". These are plants with centuries-old root systems and one year old tops. Annual fires would kill the above ground portion of the grub, but due to tremendous sprouting ability the grub would re-grow the next year. When fires ceased, these grubs grew very rapidly and became full-sized trees in a comparatively short time.

The Grady Oak Opening also has many oak grubs. Located as it is next to the Grady Prairie and a railroad, it has been accidentally burned on a number of occasions. However, since 1953 no fires have passed through the area and the grubs are now rapidly growing up. Use of fire as a control measure in this area is considered to be too dangerous, so other methods must be employed. Most promising so far is the use of the weed killer 2-4-5 T. This chemical, in an oil solution, is sprayed around the base of the young trees in the fall or early winter. At the same time care is taken not to destroy any of the prairie herbs growing amongst the grubs.

Treatment of oak grubs with a basal spray of 2-4-5 T is only about 50% effective. Therefore it must be repeated on many of the grubs. Combined with the fact of the constant occurrence of new seedlings in this area, this means that the fight to perpetuate the oak opening will be a long-continued one. The expenditure of time and materials for this project is considered justified because this interesting plant community has elsewhere been almost completely destroyed as a result of the activities of the white man.

----- G. Cottam.

Interesting Plants of the Arboretum - 11. The Blazing Stars

Blazing Stars are showy members of the genus *Liatris* in the Composite family. They differ from the Gay Feathers of the same genus in that the individual heads of flowers are much larger and are separated from each other on the flower spike, rather than small and crowded together into a continuous cylinder as in the Gay Feather. Four species of Blazing Star have been established on the prairies of the Arboretum - *Liatris aspera*, *Liatris cylindracea*, *Liatris ligulistylis*, and *Liatris squarrosa*. These have no distinguishing common names, but they differ from each other in a number of ways.

The most abundant species is *Liatris aspera*, with a population in excess of 10,000 individuals on the main prairie, and with almost that many on the Grady

Prairie. It has a basal cluster of long narrow leaves from the center of which arises one or more flower spikes that attain a height of 2 to 4 feet. The uppermost 12 to 18 inches of the spike is set with a series of very short lateral branches, each ending in a head of flowers of bright magenta. The heads are approximately one inch in diameter and are enclosed at the base with a series of overlapping membranous bracts or scales of light pink color. In common with all members of the genus, the terminal head on this species is the first to open its flowers, with the opening proceeding gradually down the spike. It is this peculiar habit which makes the plant so valuable as a source of cut flowers, since the old flower heads may be removed as they turn brown by snipping off the top of the stem, thus retaining the beauty of the bouquet for a long time. The plants begin to bloom in August, with some individuals, especially of the variety *intermedia*, remaining in bloom until mid-October.

Very similar to the last is *Liatris ligulistylis*. This species is rare in southern Wisconsin but is sometimes found in abundance on the jack pine barrens of the northwestern portion of the State. It differs from *L. aspera* mainly by the presence of a very large terminal head, often 2 inches in diameter, and by the deep red color of the floral bracts. It is similar in size to the first species but usually does not remain in bloom past the first of September.

The remaining two species are much smaller, although both retain the same growth form, with a basal cluster of grass-like leaves and an erect central stem. *Liatris cylindracea* is a plant of dry lime prairies in southern Wisconsin. Its flower spikes are relatively few-flowered and they attain a height of 12 to 18 inches. The floral bracts are dark brown, shiny, and tightly appressed in a narrow cylinder. The flowers themselves are deep magenta in color. *Liatris squarrosa* is found typically on the western plains but occurs rarely on the prairies of northwest Wisconsin. Its most distinguishing character is found in the bracts, whose tips are pointed and recurved, giving a spiny appearance to the involucre. The individual florets of the flower heads are larger than usual and relatively few in number, imparting a star-like quality to the heads.

All four species possess thickened stem bases resembling corms and all grow best in dry soils, the first two preferring acid sands or sandy loams while the last two are found on heavy alkaline soils. In the garden, their biggest fault is a tendency to become over-grown and ungainly when given too much water and too much nitrogen. To see them at their best, they should be grown in as dry and sterile a soil as the garden affords. Given such conditions they will increase in size and beauty with each passing year, as they are absolutely hardy and are subject to few pests and diseases.

-- J. T. Curtis.

Seeding Program for Grady Tract Prairie, 1957-58.

The forty-acre Grady Prairie, as a result of intensive effort at transplanting and seeding for the past 14 years, has in the main a full complement of the principal prairie species, qualitatively speaking, except for a small area of about three or four acres in the northwest portion and perhaps eight or ten acres to the southwest. 1) The northwest corner is a mesic situation with a black, sandy loam soil which, on the basis of previous experience, will support a diverse and characteristic prairie flora. Seed of certain species has been planted this fall, while the remainder will be stratified in soil taken from this site, held over winter at low temperatures, and broadcast over the surface, following a

planned burning of the prairie in the spring of 1958. Seeds of the following plants are being used: wild onion (*Allium stellatum*), lead plant (*Amorpha canescens*), little bluestem grass (*Andropogon scoparius*), wild asters, (*Aster azureus*, *A. laevis*), Canada milkvetch (*Astragalus canadensis*), wild indigo (*Baptisia leucantha*, *B. leucophaea*), pale Indian plantain (*Cacalia tuberosa*), shooting star (*Dodecatheon meadia*), pale coneflower (*Echinacea pallida*), boneset (*Eupatorium altissimum*), sunflower (*Heliopsis scabra*), blazing star (*Liatris aspera*), prairie clovers (*Petalostemum candidum*, *P. purpureum*), prairie parsnip (*Polytaenia nuttalli*), yellow coneflower (*Ratibida pinnata*), rosinweeds (*Silphium integrifolium*, *S. laciniatum*), goldenrods (*Solidago rigida*, *S. speciosa*), prairie dropseed grass (*Sporobolus heterolepis*), golden alexander (*Thaspium trifoliatum*). Emphasis is being placed on establishing a good stand of prairie dropseed grass, as this has been found to do well under Grady Prairie conditions and is one of our most characteristic and desirable prairie species, with no tendency toward weediness, even when competitive conditions are out of balance. The same cannot be said for big bluestem and Indian grass. 2) The southwest piece is rather low and poorly drained, with a considerable stand of weeds growing on a clay overlay, which has washed down over a long period from higher land to the south. For this area it is planned to introduce plants which are high growing and strong competitors, even though several are marginal prairie species at most. The seed mixture that will be used after the spring burn is as follows: Big bluestem (*Andropogon gerardi*), Indian plantain (*Cacalia atriplicifolia*), yellow coneflower (*Ratibida pinnata*), sweet coneflower (*Rudbeckia subtomentosa*), Rosinweeds (*Silphium integrifolium*, *S. perfoliatum*).

Arboretum Personnel

Chairman of the Arboretum Committee	A. F. Gallistel
Executive Director	G. W. Longenecker
Research Coordinator	J. T. Curtis
Superintendent	J. R. Jacobson
Botanist	E. T. Cawley
Editor, Arboretum News	H. C. Greene

The University of Wisconsin Arboretum
A. F. Gallistel, Chairman
Observatory Hill Office Building
Madison 6, Wisconsin



ARBORETUM NEWS

Vol. 7, No. 2

Madison, Wisconsin

April, 1958

New Development Plan for the Camp Woods Area

J. T. Curtis, *Chairman*

Arboretum Technical Committee

The third detailed development plan to supplement the general master plan has now been completed. The first of these plans, in 1951, dealt with the main prairie, while the second, in 1954, concerned the Aldo Leopold Memorial Pine Forest and adjacent areas. The new plan describes the plant communities in and around the Camp Woods. Much of the information included in the plan was collected by students in the course, Botany 166, Vegetation Management. The complete report contains 32 pages plus 19 tables and 10 maps; its most important features are summarized in this article.

The Camp Woods is the woods just to the east of the present Arboretum Headquarters area. The name was originally applied when a Civilian Conservation Corps camp occupied the present Headquarters site in the 1930's.

The area involved includes the Camp Woods, small areas adjacent to its northwest and southeast corners, and a portion of the forest to the east of the new impoundment on Teal Creek. The total area is 30.55 acres. The elevations vary from 915 feet at the northwest corner to 860 feet along the eastern edge. The general trend of the slope is to the southeast, with drainage into Lake Wingra by way of Teal Creek. The soils belong to the Miami catena and include the following soil types in order of decreasing drainage: 6.3 acres of Bellefontaine, 8.6 acres of Miami, 3.7 acres of Celina, 5.9 acres of Crosby, 0.7 acres of Brookston and 4.1 acres of Clyde. The last three have poor to very poor internal drainage.

The land was first settled in 1836. A rather complicated real-estate history, involving a number of farmer-owner and urban subdivision interests, eventually resulted in the acquisition of the land by the University in 1934. The western half of the area remained under farm management until 1928 but has been undisturbed since that time, while the eastern half has been free of utilization

pressure since 1903. Two small areas of the eastern half were clear-cut about 1900 but were allowed to regrow and have since become covered with a dense second-growth forest.

The major developmental efforts under Arboretum auspices have been the construction of trails, a forest nursery, and a dam and impoundment on Teal Creek. Limited plantings of herbs, shrubs, and trees have also been made, beginning about 1940.

A 20% sample of the existing tree cover reveals that there are 287 trees over 1 inch in diameter per acre, with a total basal area of 105 square feet per acre. The most important species is black oak (*Quercus velutina*) with an importance value of 100. Other major species, with their average importance values, are black cherry (*Prunus serotina*), 68; bur oak (*Q. macrocarpa*), 53; White Oak (*Q. alba*), 32, and shagbark hickory (*Carya ovata*), 16. Altogether, there are 14 species of trees present. The black cherries are particularly notable because of their high number and also because of the presence of several very large specimens over two feet in diameter. The understory is composed of typical oak forest herbs and shrubs, including such characteristic species as *Amphicarpa bracteata*, *Anemone quinquefolia*, *Aralia racemosa*, *Circaea quadrisulcata*, *Cypripedium pubescens*, *Desmodium glutinosum*, *Galium concinnum*, *Hystrix patula*, *Osmorhiza claytoni*, *Phryma leptostachya*, and *Solidago flexicaulis*.

It is proposed to maintain a portion of the area in its present state and to convert the remainder to other forest communities by underplanting and gradual replacement. All communities are to be made as complete as possible, in terms of species composition, and as nearly natural as possible, in terms of relative densities. During the maturation period and at maturity, the forests will be used by the University classes as study areas for various aspects of community dynamics. A large element of other public instruction will also be involved, varying from supervised groups of school children to organized groups of adults and to independent visits by interested individuals. The major interests motivating these visitors will probably be the wild flowers and birds which may be seen there, but other goals may also be achieved by proper planning. In addition to these educational aims, the proposed forests will also provide material for a broad program of research in field biology including studies in both plant and animal ecology, taxonomy, and soil science.

The three forest types planned for the area include a dry upland hardwood forest, a mesic hardwood forest, and a wet mesic lowland forest. The first two are to duplicate common Wisconsin forests, while the last is to reproduce a type poorly represented in Wisconsin but one which is best developed on the poorly drained till-plains of the Ohio River valley. The first type will be dominated by trees of black oak, bur oak, black cherry and shagbark hickory, such as now cover the entire area. The second type will be dominated by sugar maple, basswood, slippery elms and ironwood, while the last will have important representations of such trees as tulip-tree, sycamore, Kentucky coffeetree, sour gum, and sweet gum.

As in earlier detailed plans, a guide to the composition of the proposed communities, in terms of species and number of individuals, was obtained from the records of the Plant Ecology Laboratory of the University. These are based on many native stands in Wisconsin and provide an average composition that can

serve as a planting guide. The plans for the Ohio Valley Forest were supplemented by a study of pertinent literature dealing with stands in Illinois and Indiana. From these sources were obtained the following lists of species and densities per acre:

Dry Oak Forest (9.4 acres)

Black Oak -60, White Oak -45, Black Cherry -15, Bur Oak -10, Red Oak -10, Hills' Oak -5, Shagbark Hickory -5, plus lesser numbers of Slippery Elm, American Elm, Largetooth Aspen, Red Maple, Black Walnut, and Chestnut Oak

Mesic Hardwood Forest (10.7 acres)

Sugar Maple -125, Slippery Elm -35, Basswood -20, Ironwood -10, White Ash -10, Yellowbud Hickory -10, Red Oak -5, plus Butternut, White Oak, Kentucky Coffeetree, Hackberry, Black Walnut, Blue Ash, and Cork Elm.

Ohio Valley Lowland Forest (10.4 acres)

Beech -40, White Oak -35, Red Maple -15, Sweet Gum -12, Sour Gum -9, Pin Oak -8, Shagbark Hickory -8, American Elm -5, plus Red Oak, Black Oak, Cork Elm, Mockernut, Red Ash, Honey Locust, Kentucky Coffeetree, Sycamore, Shingle Oak, Sugar Maple, Tuliptree, White Ash, Papaw, Redbud, Flowering Dogwood, Persimmon, Sourwood, and Sassafras.

All of the important herb and shrub species characteristic of a Wisconsin oak forest are now present and will not need to be planted. In the case of the mesic forest, a number of species have been introduced in the past 18 years and some have become well established, including *Sanguinaria canadensis*, *Hepatica acutiloba*, *Dicentra cucullaria*, *Trillium grandiflora*, *Hydrophyllum virginianum*, *Caulophyllum thalictroides*, *Claytonia virginica*, *Erythronium albidum*, *Trillium nivale*, *Jeffersonia diphylla*, *Phlox divaricata*, *Dentaria laciniata*, and *Isopyrum biternatum*. Additional species which are still to be introduced include: *Floerkea proserpinacoides*, *Hydrastis canadensis*, *Panax quinquefolia*, *Hydrophyllum appendiculatum*, and *Trillium recurvatum*.

The expected understory of the Ohio Valley Lowland Forest will include: *Campsis radicans*, *Cephalanthus occidentalis*, *Hamamelis virginiana*, *Hydrangea arborescens*, *Ilex verticillata*, *Lindera benzoin**, *Sambucus canadensis**, *Viburnum lentago**, *Viburnum prunifolium*, *Polystichium acrostichoides*, *Arisaema dracontium*, *Lobelia cardinalis*, *Phlox divaricata**, *Polemonium reptans**, *Tiarella cordifolia*, *Mertensia virginica**, and *Uvularia grandiflora**.

Judging by the rate at which previously introduced harbaceous species are spreading, it is estimated that a reasonably complete understory may be obtained for the mesic and lowland portions in from 10 to 15 years. The excellent growth of trees planted in the 1940's indicates that the tree canopy may approach a reasonable approximation of the desired goals in from 20 to 25 years (mid-1980's), although of course the new trees will still be rather small and there will probably still remain an excess of old oaks. The benefits to be derived from the area will not need to await its complete development, however, as much of great value concerning the dynamics of establishment and spread of typical forest plants can be learned during the maturation period.

*Those species already present

Arboretum Woods Nursery

This nursery was established a number of years ago in the Camp Woods. It is 100 feet square, surrounded by a five-foot chain-link fence set on a deep concrete foundation, supposedly rodent-proof, but obviously not deer-proof. Woods wild flowers have been propagated with good success, and from time to time transplanted along our various wild flower paths and trails. Among the many species which have been raised are three kinds of trilliums, wild ginger, Dutchman's breeches, toothwort, hepatics, isopyrums, spring beauties, golden seal, baneberry, yellow and showy ladyslippers, phlox, and anemonella. In the spring of 1957 sods were removed from along the entire south edge of the nursery and transplanted into the woods (all are thriving in 1958) and a row of small hemlocks was planted as a replacement. These seem to be doing very well indeed, much better than under slats in the main nursery. As might be expected the shelter, humidity, and shade conditions in the woods are evidently optimum for hemlock. The woods nursery is a valuable Arboretum asset and should find expanded use in the future when we have largely completed our present program of setting out trees and other long-lived woody species.

Woods Path Improved

The southernmost path in the Camp Woods has been graveled for a distance of perhaps 150 yards to make for better walking in the low, wet portion, and to keep hikers from straying from the path in an effort to avoid a muddy mess, and thus creating more of a mess.

Arboretum Personnel

Chairman of the Arboretum Committee.	A. F. Gallistel
Executive Director	G. W. Longenecker
Research Coordinator	J. T. Curtis
Superintendent	J. R. Jacobson
Botanist	E. T. Cawley
Editor, Arboretum News	H. C. Greene

The University of Wisconsin Arboretum
A. F. Gallistel, Chairman
Observatory Hill Office Building
Madison 6, Wisconsin



ARBORETUM NEWS

Vol. 7, No. 3

Madison, Wisconsin

July, 1958

Drouth Hits the Arboretum Again

Every few years the residents of south-central and southwestern Wisconsin are forcibly reminded that they live in an area which offers only precarious support to a mesic vegetation, in view of recurrent drouth conditions, such as prevailed throughout most of the 1930's, were considerably ameliorated in the 1940's, but which, now in the 1950's are with us again. As this is written at the end of July, the Madison area is 7-8 inches behind "normal" in precipitation for the year, and normal is little more than just barely adequate. The last significant and almost the only beneficial rain since last summer fell on the Memorial Day week-end, when about $4\frac{1}{2}$ inches poured down. In going over back issues of the Arboretum News we find drouth trouble mentioned in 1952, 1953, and particularly in 1955. Present conditions in the Arboretum, at mid-summer, are beginning to approach those of September 1955, as described in the News for October of that year, and it seems likely the subsoil deficit is worse. Until recently relatively cool days and nights had helped to hold damage in check, but a current heat wave has cancelled out this benefit. Many of the woody plantings made this spring are suffering severely and most, if not all, will probably be lost, even should substantial rains fall in the immediate future – and there seems no prospect of this. Long established trees and shrubs in the higher parts of the Horticultural Area at headquarters are wilting and yellowing. Supt. Jacobson, in an effort to save them, has assigned a man to the job of watering them, using our fire tank truck, but the efficacy of such measures is doubtful. We can only hope that the present weather pattern will be reversed to a wetter one in 1959 and following years.

Work on Laboratory Building in Progress

Repairs and alterations are now being made on the Arboretum Laboratory. Included are new window frames, changes in some rooms as regards doors and position of partitions, and plumbing alterations and additions. Most important, however, is the projected installation of our long-desired central heating plant, which will greatly increase the year-around usefulness of the building.

Controlled Burning of Arboretum Prairies

The central and east portions of the large prairie and the entire Grady Tract prairie were successfully burned in April 1958. Experience has shown beyond any doubt that prairie vegetation cannot only withstand occasional burning, but is greatly benefited by it, and thus the Arboretum prairies are burned according to schedule. Experience has also shown us the best ways to handle such burns with crews of moderate size, but with a minimum of risk at the same time. We have accumulated an extensive array of fire-fighting equipment which is all readily available. Included is a fire-engine tank truck with hose and fog nozzle, a four-wheel-drive jeep with tank and Panama pump, numerous back pumps, hand sprays, mops (strips of old carpet attached to mop handles, kept wet, and used to beat out small blazes), pails, and many drums and other smaller containers of water, kept strategically placed at all times. The 1958 burning of the eastern two-thirds of the Grady prairie offers a good example of technique in doing a controlled burn. After the west third had been burned, the entire crew was assembled at the east edge of the prairie and, against the prevailing wind from the west, participated in backfiring a 100-foot wide strip from the south to the north edge of the prairie. When this was completed the fire was again touched off at the south corner of the burned strip and half the crew carried the fire line slowly west along the south edge of the prairie, while the rest relit the entire edge of the previously burned strip, and then carried the fire along the north edge of the prairie. Thus the fire was continually under control, burning slowly against the wind. When the major portion of the area had thus been slowly and thoroughly burned, the fire lines were finally brought together at the west edge and the burn completed. Burning against the wind is not only safer, but generally gives a better burn, although less spectacular than when the fire is swept along with the wind. Of course, the way in which a burn is carried out will depend on conditions, danger of igniting adjacent vegetation such as pine plantings, humidity conditions, and other factors. We naturally do not attempt burning when the winds are high and gusty.

Native Plants as Competitors

Native plants are often thought of as poor competitors, as witness their almost total disappearance from wide areas and their replacement by broad-leaved weeds and weedy grasses, such as quack and Kentucky bluegrass. Observations on the Arboretum suggest, however, that native prairie plants, at least, are poor competitors only when ranged against man and his works, and to a lesser degree against animals. In competition against weeds the native plants will prevail, and in a surprisingly short time. For example, in the Grady Tract Prairie, formerly cultivated land, there was a large patch of heavy Kentucky bluegrass at one

point which excluded all competition, seemingly, and promised to continue to do so. In 1952 a number of small sods of the native little bluestem, *Andropogon scoparius*, were transplanted at widely spaced intervals in the Kentucky bluegrass. These sods have not only survived, but seeded in so successfully that in 1958 they have almost entirely replaced the bluegrass. Essentially the same observations could be applied to many other cases. It should be noted that most disturbance, including drainage overrun, favors weeds and tends to eliminate prairie species. The prairie area north of the Madison Beltline has been subjected to repeated silting, as a result of erosion following road construction projects, with much weed trouble, particularly from parsnip and sweet clover. This tends to be self-perpetuating, as a result of the lay of the land, but perhaps there will be eventual stabilization.

Pine Forest Herbs

In the description of the Master Plan for the Aldo Leopold Pine Forest given in the Arboretum News, Vol. 4, No. 2, 1955, it was indicated that the herb plantings made prior to that time had been relatively unsuccessful. It now appears that the judgement was a little hasty, since more recent observations have shown that a number of the early plantings actually did survive and have now become thriving colonies. In the spring of 1958, seventeen species of typical pine forest herbs were found in healthy flowering condition. Included were such characteristic plants as *Maianthemum canadense* (Canada Mayflower), *Mitchella repens* (Partridge Berry), *Trillium grandiflorum* (Large Trillium), *Trientalis borealis* (Starflower), *Cypripedium acaule* (Red Ladyslipper), *Anemone quinquefolia* (Windflower), *Coptis trifolia* (Goldthread), *Streptopus roseus* (Twisted Stalk), *Polygala paucifolia* (Fringed Milkwort), *Aralia nudicaulis* (Wild Sassaparilla), *Clintonia borealis* (Bluebead), *Myrica asplenifolia* (Sweet Fern), and *Arctostaphylos uva-ursi* (Bearberry). It is notable that only two of these are evergreen (*Mitchella* and *Arctostaphylos*) although a number of other evergreen species were included in the initial plantings. A clue as to the reason for the failure is provided by plantings made in 1956 and 1957 (Arboretum News, Vol. 6, Nos. 1 and 4) which were enclosed in rabbit-proof fences. Healthy and expanding colonies of *Gaultheria procumbens* (Wintergreen), *Epigaea repens* (Trailing Arbutus), *Goodyera decipiens* (Greater Rattlesnake Plantain), *Vaccinium angustifolium* (Blueberry), *Cornus canadensis* (Dwarf Dogwood), and *Rubus parviflorus* (Thimbleberry) are present within the fences, although none had survived planting in the open. It is apparent, therefore, that the environmental conditions in this twenty-year old pine plantation are favorable for the growth and reproduction of the typical groundlayer species of pine forests, but that the successful establishment of many of them is currently impossible because of the abnormally high population of rabbits present over the area.

----- J. T. Curtis.

Arboretum Personnel

Chairman of the Arboretum Committee	A. F. Gallistel
Executive Director	G. W. Longenecker
Research Coordinator	J. T. Curtis
Superintendent	J. R. Jacobson
Botanist	E. T. Cawley
Editor, Arboretum News	H. C. Greene

The University of Wisconsin Arboretum
A. F. Gallistel, Chairman
Observatory Hill Office Building
Madison 6, Wisconsin



ARBORETUM NEWS

Vol. 7, No. 4

Madison, Wisconsin

October, 1958

Fall Plantings Favored by Timely Rain

Our fall planting program was greatly aided by a substantial rain of $2\frac{1}{2}$ -3 inches which fell in early October and provided good soil moisture at the time we needed it most. It may be noted that in total rainfall needed to replenish the sub-soil water level the Madison area is still far behind. For transplanting, however, moisture was adequate and much was accomplished. Our "shelter belt" in the southwest portion of the Grady Tract is, according to Supt. Jacobson, virtually complete as far as planting is concerned, with only a few river birch to be added. It is expected that the fast-growing trees which have been set out here will materially assist the development of the slower growing oaks and other hardwoods directly to the east by cutting down on the desiccating action of the prevailing westerly winds of fall and winter. Northward, along the fence line from this area to the gate on the Fitchburg-Madison Town Line, more than 200 very sizeable assorted hawthorns from our nursery were set out this fall. This gives us a continuous screen planting along the entire west boundary of the Grady Tract. It will probably need some additions in years to come, but even so represents a very sizeable planting effort to date. With the rapid development of residential subdivisions adjacent to practically all our boundaries we feel that such screen plantings are desirable and appropriate and in no way interfere with public use and enjoyment of the Arboretum, since there are numerous open gates through which pedestrian visitors may freely enter and leave. Another such planting has recently been started along the Grady Tract east fence, running northward from the C. & N.W.R.R. right-of-way to the northeast corner of the Grady Prairie and in time it will probably be extended along the entire east boundary of the Grady Tract.

Arboretum Plant Communities

Professor J.T. Curtis, Arboretum Research Coordinator, in connection with the implementation of the Arboretum Master Plan, has recently drawn up and obtained approval of a detailed treatment of the location, composition, establishment and maintenance of the demonstration plant communities which are a

principal feature of the Arboretum. According to Prof. Curtis "One of the major aims of the Arboretum has always been the establishment of living examples of the major types of plant communities which can be expected to survive the climate of Madison (According to the Arboretum Manual these communities initially were to be limited to those occurring along the prairie-forest border from Manitoba to Missouri) . . . Many purposes will be served by these demonstration communities. They will be used as outdoor laboratories by University classes in field biology, and as the scene of varied research projects by both advanced students and staff members in the same field. One of the major benefits to be derived from them stems from the ability of a group of dominant plant species, such as will be important in each of the communities, to so modify the local environmental conditions as to permit the successful growth of many lesser plants and animals which would be unable to survive the unmodified environment. Because of this interaction the communities will serve as reservoirs of and protectors for many rare species which are in danger of becoming extinct elsewhere. Even under the relatively incomplete condition of most of the communities at the present time, they now harbor a significant number of such rare plants. The relative benefits for both educational and research goals are proportional to the degree of completeness of the communities, to the naturalness of their behavior, and to their size. The first of these criteria can be satisfied by an intensive planting program, while the second will probably depend upon the difference between the Madison climate and the home climate of the community. The third criterion is the most difficult, in that many of the communities must be planted on special soil types, and these are not present in equally large areas in the Arboretum. As a result, a few of the proposed types will necessarily exist in suboptimum sizes . . . The natural plant cover which would develop on practically all of the Arboretum if it were left to its own devices would be some type of forest. This means that some type of vegetational control must be exercised on all of those areas designated as open communities, such as prairie, fen and meadow. Further, any forest type other than oak or maple must be constantly guarded against invasion by these native dominants. As a result, the community development program must be recognized as one requiring constant expenditures for maintenance, and it cannot be thought that the initial development cost is a final cost. Rather, there will be a continuing demand on the budget for maintenance, just as in the case of horticultural plantings and other activities." In summation, the communities are scheduled to occupy about 500 acres, and are in five principal categories, 1) Open, 2) Savanna, 3) Deciduous Forest, 4) Partial Evergreen Forest, 5) Exotic. A total of twenty-eight different communities are involved, as follows: A. Open Communities (150 acres) 1. Dry lime prairie, 2. Dry prairie, 3. Mesic prairie, 4. Wet prairie, 5. Fen, 6. Sedge meadow, 7. Shrub Carr, 8. Alder thicket, 9. Bracken-grassland, 10. Sand barrens, 11. Open marsh. B. Savanna Communities (31 acres). 12. Cedar glade, 13. Bur oak opening, 14. Black oak barrens. C. Deciduous Forest Communities (154 acres). 15. Dry oak forest, 16. Dry-mesic oak Forest, 17. Mesic maple forest, 18. Southern-wet-mesic forest, 19. Wet lowland forest. D. Partial Evergreen Forest Communities (153 acres). 20. Dry jack pine forest, 21. Dry-mesic white pine forest, 22. Mesic maple-hemlock forest, 23. Mesic beech-hemlock forest, 24. Cedar swamp, 25. Tamarack-black spruce swamp, 26. Spruce-fir forest, 27. Mischwald tension zone forest. E. Exotic Community. 28. Ozark pine-oak forest (7 acres). It is possible that several other exotic communities will be developed in the future.

Addition to Trail System

A new circulating trail was laid out this fall in the northwest section of the Grady Tract, running from the Beltline Highway pedestrian underpass westward through the pine plantings to the gate and parking lot in the extreme northwest corner, with a branch running southward through a deciduous-wooded ravine to the graveled fire-land road which eventually comes out at the above-mentioned parking lot. This provides a very pleasant walk through an area which was previously essentially inaccessible, with a fine vista of downtown Madison at one point. While not generally as large as in the older plantation across the Beltline, many of the pines here are now very sizeable, and there is a diverting succession of woods and openings, lacking in the denser, older woods across the road.

Understory Plantings in Pines

Efforts made in earlier years to introduce typical plants of the pine woods floor were largely unsuccessful, in part at least we think because the woods had not progressed far enough with natural pruning of the lower branches and were too dense, and in part because many of the plants seem to be ideal rabbit browse, and are unable to withstand a high population, such as we unfortunately have on the Arboretum. Both the Leopold Pines (a mixture of red and white pine) and our jack pine plantation have opened up a great deal in the last four or five years, and it seemed that it would be worthwhile to initiate another planting program at this time, supplemented by screen exclosures to fence out the rabbits until such time as their numbers can be brought under control (we hope!). Such exclosures have recently proved very successful on a small experimental scale in both the Leopold and jack pines. Accordingly, in the summer and fall of 1958 Supt. Jacobson and Arboretum Botanist Ed Cawley made considerable efforts to obtain and set out appropriate plants, fencing them where deemed necessary and also watering because of the extremely dry summer. Supt. Jacobson made an October trip to northern Wisconsin and obtained many plants which were set out as follows: A. Leopold Pines. Red maples, clumps of assorted ferns, huckleberry, blueberry, wintergreen, partridge berry, bearberry, bunch berry, trailing arbutus, as well as certain woody plants found growing in close association with pines in their northern habitat, including several types of dogwood, witch hazel, dwarf hazelnut, white birch and cherry. B. Jack Pines. Sweet ferns, assorted ferns, huckleberry, blue berry, bearberry, amelanchier, cherry, New Jersey tea, bush honeysuckle, lupines, wood lily dogwoods, hazelnut and witch hazel. Botanist Cawley's plants were got from two principal sources 1) pine relics in southern Wisconsin, of which there are many to the wouthwest of Madison, and 2) the northern and central Wisconsin pine areas, including Vilas County, the Black River Falls area and other points in central Wisconsin. Mr. Cawley made about 600 individual plantings including such things as maianthemem, wild sarsaparilla, star flower, barrens strawberry, bracken, bunchberry, partridge berry, wintergreen, goldthread, twinflower, rattlesnake plantain, shinleaf and others. Cawley also collected seed of some of these things for the purpose of studying the possibility of direct seeding next spring, using stratified seed. If feasible, this will enable us to do a really extensive job at a minimum cost.

Carp Removal from Lake Wingra

Of interest to the Arboretum, since its borders include a large section of the shore of Lake Wingra, is the carp removal program carried out by the Wisconsin Conservation Department in cooperation with members of the University of Wisconsin Zoology Department, and reported on in a paper entitled "Some vital statistics in a heavily exploited population of carp" (Jour. Wildlife Managem. 21: 279-292. 1957). In the course of a two-year period, 1953-1955, the carp population was reduced about 90% by seining and natural mortality. Since the aquatic vegetation of the lake had suffered severe damage from the carp, it is now reasonable to expect a good recovery of the vegetation, at least for the next few years, even lacking further control measures.

Arboretum Personnel

Chairman of the Arboretum Committee	A. F. Gallistel
Executive Director	G. W. Longenecker
Research Coordinator	J. T. Curtis
Superintendent	J. R. Jacobson
Botanist	E. T. Cawley
Editor, Arboretum News	H. C. Greene

The University of Wisconsin Arboretum
A. F. Gallistel, Chairman
Observatory Hill Office Building
Madison 6, Wisconsin