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A botanical history of Downer Woods

Peter J. Salamun
University of Wisconsin-Milwaukee

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A BOTANICAL HISTORY OF DOWNER WOODS

The pattern of vegetation which occurs in Downer Woods, a wooded tract on The University of Wisconsin–Milwaukee campus and a landmark on Milwaukee's east side, is a reflection of the uses to which it has been subjected for a period of over two hundred years. Information to document this has been compiled by students in various field courses and by faculty members and individual students who carried out independent investigations in this woods. These persons checked land deed records, surveyors records, interviewed long-time residents who are familiar with the woods, counted tree rings and evaluated the present vegetation through a variety of sampling methods. The historical interpretation presented here is essentially their story.

In the past the woods was more extensive, but the portion considered in this report was originally bounded on the north by East Edgewood Avenue, on the east by North Downer Avenue, on the south by East Hartford Avenue and on the west by North Maryland Avenue. Sometime prior to 1896 this tract came into the possession of Guido Pfister who operated a dairy farm in this section (Sec. 10, T7N, R22E). The exact date of Pfister's acquisition of this land is unknown because title records before 1896 could not be located (Hamberg, 1966). Over a period of twenty-five years this person and his heirs, Elizabeth Pfister, Charles F. Pfister and Louise F. Vogel, deeded portions of this property to the young and struggling women's college which became known as the Milwaukee-Downer College. The first parcel of ten acres was deeded in 1896, and was followed by additional parcels of approximately five acres in 1904, six acres in 1905 (in two parcels, the larger one was located south of East Hartford Avenue), eight acres in 1911, fifteen acres in 1913 and eleven acres in 1921. The locations of these parcels, their exact acreages and dates of transfer to the college are shown in Fig. 1. Buildings were erected on this campus in the years 1897 to 1938, most of them located within the area of the first-deeded parcel. Only the Chapman Memorial Library (now Chapman Hall),

completed in 1938, was located on a different parcel, the one deeded in 1913. No major landscaping was carried out on this campus except in the immediate vicinity of the buildings, although a grassy border was maintained along the periphery of the woods. The remaining wooded area was used by the students and faculty for biology field trips, bird watching, pleasure walking, picnicking, the "annual hat hunt" and it also served as a natural background for outdoor dramatic presentations (Kieckhefer, 1950).

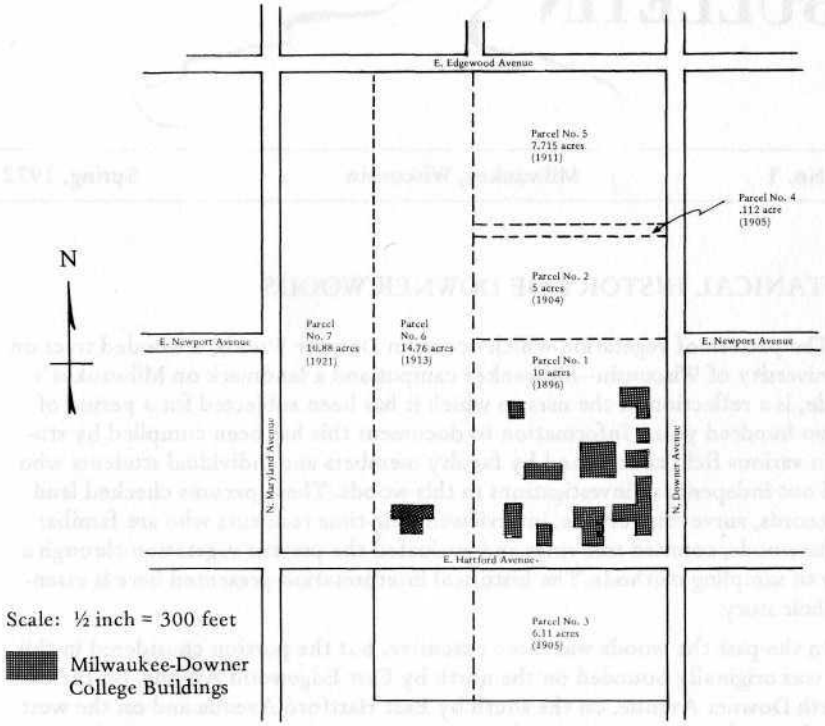

Fig. 1. Land parcels deeded to the Milwaukee-Downer College by Guido Pfister, Elizabeth Pfister, Charles F. Pfister and Louise F. Vogel. The buildings were erected by the College between 1897 and 1938.

In July, 1964, the Milwaukee-Downer College merged with Lawrence College in Appleton, Wisconsin, and sold its Milwaukee property to the rapidly expanding University of Wisconsin–Milwaukee. At the time of transfer of this property, the wooded portion, which became known as "Downer Woods," was approximately 30-35 acres in size (Fig. 2). Since then the acreage has been reduced further by the development of a parking area in the eastern portion and by the construction of the Temporary Academic Building northwest of Sabin Hall and the Carl Sandburg Residence Hall at the western edge of the woods. At the present time approximately fifteen acres remain in a wooded or partially wooded condition and retain some interesting botanical and zoological features.

Table 1. Summary of the 1964-1971 surveys of the vegetation in Downer Woods.

Species	*Density (%)*	*Frequency (%)*	*Dominance (%)*
	Trees (diameters 4 inches or more DBH)		
Ash, Green and White	30	40	20
Basswood	25	40	8
Hawthorns	20	20	8
Oak, White and Bur	10	20	34
Elm, American	1	3	1
Ironwood, Hop Hornbeam	1	3	0.3
Others	3	–	0.7
	Tree Saplings (diameters 1-3 inches DBH)		
Ash, Green and White	55	44	
Basswood	15	13	
Hawthorns	20	25	
Oak, Red	2	3	
Others	8	–	
	Tree Seedlings		
Ash, Green and White	67	100	
Basswood	20	30	
Oak, Red	6	10	
Others	8	–	
	Shrubs		
Buckthorn	11	20	
Chokecherry	4	10	
Cranberry, High Bush	12	20	
Dogwood, Gray	15	20	
Dogwood, Red Osier	15	20	
Honeysuckle, Tatarian	26	30	
Miscellaneous	17	–	
	Herbs		
Blue Grass	12	70	
Strawberry	14	70	
Cinquefoil	12	30	
Geranium	12	30	
Dandelion	8	30	
Self-heal	4	20	
Asters	4	20	
Miscellaneous*	24	–	

*Includes spring-flowering species which were tabulated in only one special study.

From 1964 to 1971 a number of classes in plant geography and plant ecology at The University of Wisconsin–Milwaukee have studied the vegetational composition of this woods. All of these classes employed similar methods in their investigations and arrived at similar conclusions concerning the present structure of the woods and the interrelationships among the individual plant species within it. Because of the limited time available during class periods, these studies relied on sampling methods for obtaining information about the plants. The one used most frequently and is the basis of the vegetational analysis in this report is referred to as the "random pairs" method (Cottam and Curtis, 1949) or its variation the "quarter method" (Cottam and Curtis, 1956). Using this method, the classes traversed the woods along predetermined compass lines and at definite intervals of 50-100 paces laid out sample plots or quadrats, each one square meter in size. The types of tree seedlings and saplings, shrubs and herbs within each quadrat were recorded. In addition the two or four trees (with trunk diameters of four or more inches DBH) nearest the center of each sample plot were also recorded. When only two trees were tallied, the first one was selected by its nearness to the center of each quadrat and the second one by its nearness but outside of a 180° sector from the first. When four trees were considered, each quadrat was divided into four quarters and the trees nearest the center but adjacent to each quarter were recorded. The diameters of the trunks of these trees, at breast height (DBH), were also measured and their cross-section areas or basal areas were computed. The plants recorded in ten to twenty quadrats and the associated trees were analyzed statistically to determine the characteristics of this woods.

A compilation of the analyses from the various studies carried out from 1964 to 1971 are listed in Table 1. In this tabulation the plants are arranged in classes (trees, saplings, seedlings, shrubs and herbs) according to their densities and frequencies. The dominance values for the trees are also included in the tree class. Density, expressed as the percentage of each species with respect to the total number of species recorded, indicates how numerous each species is in this woods. Frequency, which indicates how widespread each species is in the area, is represented as the percentage of the total number of quadrats in which each species was listed. The importance of each tree species, based on the cross-section area (basal area) of each trunk, is indicated under the heading of dominance. Each figure in this column represents the sum of the basal areas of the individual trees of each species expressed as a percent of the total basal area for all the trees sampled. Species with the largest percentages of the total basal area are the largest and probably the dominating trees in this woods.

These data indicate that in the tree class the ashes, basswood and hawthorns are the most numerous (densities of 20-30%) and most widespread (frequencies of 20-40%) in the sample areas, but are of relatively small size as indicated by dominance values of only 8-20%. In contrast, the largest trees are the oaks, with dominance values of 28% and 34%, although they are less numerous (densities of 10%) and widely scattered as indicated by their frequencies of 20%. Since the oaks are the most conspicuous and largest trees (some 2-3 ft. DBH) they may be considered the dominants and Downer Woods may be classified as an "oak woods." The status of the more numerous and smaller ashes, basswood and hawthorns may be deter-

mined by noting their relationships in the sapling and seedling classes. In both numbers and distribution these three species rank highest in the sapling class and, except for the hawthorns, also in the seedling class. The paucity of oaks in these classes indicates they are not reproducing themselves and the ashes and basswood eventually will be the succeeding trees. Hawthorn trees although abundant and widespread in the tree and sapling classes are absent in the seedling class. This suggests their relationship to the other woody species is of a different nature. Most of the hawthorns, especially the larger ones, are found at the edges of Downer Woods, while those within it are scrawny and contain many dead limbs. Apparently these trees are intolerant of shaded conditions and are not reproducing in the woods. They probably became established when this woods was more open and are now disappearing except in the openings and at the margins of this woods.

The changing nature of Downer Woods is also indicated by the types of shrubs and herbs which are present. The shrubs, with the exception of the chokecherry and dogwoods, are chiefly exotics (introduced species) and are neither numerous (densities of 4-26%) nor widely distributed (frequencies of 10-30%). These plants are present chiefly in open areas or along the borders of the woods. Because most investigations avoided these open areas, the number of shrubs recorded was small and their density and frequency values are low. The herb flora is also predominantly of weedy species. Since many species were tallied, some so infrequently that they could only be included in the miscellaneous category, their density values are not significant. The most widely distributed ones are the blue grass and the strawberry, with frequencies of 70%. The relationship of these two herbs to the woodland plants is similar as that of the hawthorns. They probably appeared when the woods was more open and, although persisting, are slowly being shaded out. Native spring-flowering herbs such as the violets, geraniums, mayapples and wood anemones are present in this woods (McGivern, 1965), but not in sufficient numbers to show their densities and frequencies. They also are included in the miscellaneous grouping. It appears the native herb flora is not recovering very rapidly, probably because of the absence of an adequate nearby seed source.

In 1965, the eastern portion of the woods was partially cleared for a parking lot and some of the trees were cut down. One of the botany classes had the opportunity to count the annual rings in the stumps of these trees and determine their ages. These students noted the ashes and basswood trees were mostly 35-50 years of age and the hawthorns 40-70 years of age. No accurate age estimates could be made on any of the oaks because they showed extensive deterioration due to heart-rot. However, in an earlier study by Whitford and Salamun (1954), oak trees, approximately two to three feet in diameter, elsewhere in Milwaukee County were found to be 180-200 years old. If the ages of these trees are projected back in time, each species became established about the following dates:

1770 - 1790 – White Oak; Bur Oak; Red Oak
1900 - 1930 – Hawthorns
1920 - 1935 – Ashes; Basswood

These dates correlate closely with the historical events mentioned earlier. During the period of ownership by Guido Pfister and his descendants, which for some

Fig. 2. Aerial view of the Milwaukee-Downer College property at the time of transfer to The University of Wisconsin–Milwaukee in 1964.

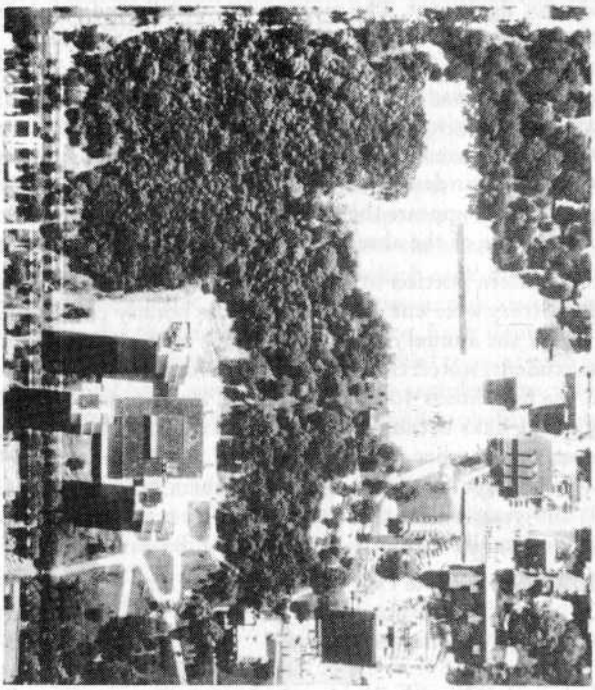

Fig. 3. Aerial view of the same area in Fig. 2 as it appeared in 1971.

Fig. 4. A view of Downer Woods from the east showing some of the large open-grown oaks and the younger ashes and basswoods.

Fig. 5. Some of the large white oaks in Downer Woods.

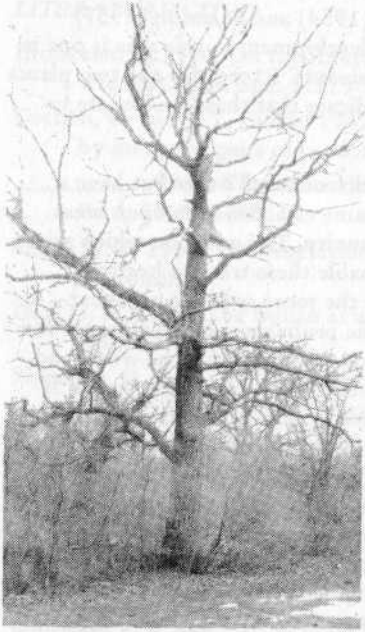

Fig. 6. A white oak at the margin of Downer Woods with an understory of honeysuckles and dogwoods.

Fig. 7. Young stand of ash and basswood trees in Downer Woods.

parcels was until 1921, the woods was part of a farm and all or part of it was pastured. The grazing animals eliminated the natural understory plants, including the reproductive seedlings, and enabled blue grass and other weedy herbs to become established. Spiny trees and shrubs, such as the hawthorns, crabapple, buckthorn, raspberry, currants and roses, which are not relished by these animals, also became established at this time. From 1900 to 1921, grazing was gradually eliminated as the various parcels were transferred to the Milwaukee-Downer College. Dr. William H. Studley, head of the Shorewood Hospital and a long-time resident of this area, recalls that some cows were pastured here until about 1915. With the cessation of pasturing, the seedlings of ashes and basswood became established; their success is indicated by their numbers and distribution in the woods today.

The history of the large white, bur and red oaks is something of an enigma. Because of their ages, it appears they became established here before any land records were made. The earliest available records, the land surveys of 1835-1836, which are filed in the office of the Commissioners of Public Lands in the State Capitol at Madison, list oak trees (some of them 2-3 ft. in diameter) as very common in this section, together with sugar maple and beech trees. Today only a single sapling of a beech and a single medium-size sugar maple tree occur in Downer Woods. The sugar maple was probably planted as it is located at the southeast edge of the woods and is adjacent to several introduced trees which obviously were planted. Earlier studies by Whitford and Salamun (1954) and Salamun (1957) suggest the climax or terminal stage of woodland development in this area is one in which the sugar maple and beech trees are the dominants. Except for the two plants mentioned, there are no seedlings or saplings to indicate that these species are invading this woods at the present time.

These large oaks are not only spaced far apart from each other but have a spreading growth pattern which indicates they became established in open areas or at the margins rather than within a forest community. The question which arises is what kept this area open in the mid-1700's to enable these trees to become established. Since only the aboriginal Indians were the more or less permanent inhabitants here at that time, it seems they were the probable ecological factor for keeping the area open. Day (1953) describes various ways in which the woodland Indians in New England established clearings in forests for their villages, and it is probable the Wisconsin Indians did the same. Some of the land clearing activities included cutting of trees for firewood and to create openings for dwelling sites and garden plots. Other clearings were made to improve visibility, establish trails and to improve hunting conditions. The latter clearings were frequently carried out by the use of fire, which sometimes escaped and denuded extensive forest areas. In these villages, trees and shrubs were allowed to persist at the margins of the clearings because they served to separate family dwellings and garden plots. The present pattern of spacing of the oaks in Downer Woods suggests they may have originated at the peripheries of such openings. Evidences of Indian inhabitations in this area include artifacts which have been found by Dr. Studley and other residents, and the record of an old Sauk trail which passed through this area. An historical marker for this trail is located north of the intersection of North Maryland and East Edgewood Avenues in the Village of Shorewood.

With the arrival of white settlers, after 1830, the woods was maintained in an open condition by the cutting of trees for fuel and construction timbers and by pasturing of livestock (Bruncken, 1900). The large oaks were spared probably because their spreading growth and large limbs produced knotty lumber, which was not in demand at that time. This open or disclimax pattern persisted in all or most of this woods until it was acquired by the Milwaukee-Downer College.

The present remnant of this woods (Fig. 3) is characterized by large, open-grown and widely spaced oak trees, with numerous, young and straight-growing ash and basswood trees and with some large, open-grown hawthorn trees at the margins and in the openings (Figs. 4, 5, 6 and 7). The understory is chiefly of exotic shrubs and herbs, but a few native species are present. These native understory plants may have persisted in the same marginal woodlands from which the oaks probably became established. Unfortunately, the recent investigations do not indicate whether these plants are expanding into the present woods.

Within a few decades it is probable that seedlings and saplings of maple and beech trees will appear in Downer Woods. Since these species are extremely shade tolerant, it is possible they will develop into mature trees which will replace the present trees as dominants. Whether or not this development will be observed by future classes will depend upon a portion of this woods being preserved.

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Peter J. Salamun
Department of Botany
The University of Wisconsin–Milwaukee