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## PRESIDENTIAL ADDRESS

### NATURAL OR SCIENTIFIC AREAS: AN ILLINOIS RESOURCE

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It has been my privilege and pleasure for fourteen years to travel throughout the State of Illinois, visiting each county each year and making collections of plants for the studies of the Illinois flora. During these years I have traveled not only the highways but also many of the back-country roads and penetrated into the less accessible countryside. I have found Illinois to be an interesting state because of its diversified habitats and floral elements. There are deciduous forests and prairie

remnants, cypress swamps and tamarack bogs, swift-flowing and sluggish streams, clear lakes and turbid ponds, flat lands and tall cliffs. These are all in Illinois, but the question is, for how long?

In 1959, Dr. Harlow B. Mills, in his presidential address before the Illinois State Academy of Science, spoke on "The Importance of Being Nourished." Dr. Mills discussed the population burst and touched on "the matter of space in relation to recreation." He brought in some thoughts on "state and national parks, wilderness areas and the like." It is on a variation of the latter—wilderness areas and the like—that I should like to dwell. Illinois no longer has true wilderness areas, but it has areas that resemble wilderness and can be called natural areas. Because these are of scientific interest and value, I shall also call them scientific areas. I should like to describe some that are in our state and show why, and perhaps how, they should be preserved.

It is difficult to define a natural area. In the strict sense it is an area in a state undisturbed by man. For our purposes I shall define a natural or scientific area as an area of any size, in which is found one or more rare species of plants or animals, or both, an important biotic community, a significant natural landscape or some prehistoric condition that has been scarcely, or not at all, disturbed by the activities of man. By this definition, Apple River Canyon State Park would be classified as a natural area. It has a significant natural landscape, the cliffs, it has a rare plant species, bird's-eye primrose (*Primula mistassinica*), and

also an interesting plant community, a deciduous forest with some northern coniferous species.

In the distant past all of Illinois would have been classified as a natural area. With the arrival of European man much of the landscape of Illinois was altered, and the natural communities were replaced by other types—the cultivated fields, the European lawns and flower gardens. The alteration and replacement were slow at first. In 1820, the population density was less than 1 person per square mile, that is, a population of 55,210 in an area of 56,400 square miles. In many localities there was little or no change in the landscape. By 1860, the population of Illinois was 20 times as large as 40 years before; it passed the million mark. The steel plow and moldboard were perfected, and draitile appeared on the market in quantity. Vast expanses of flatland prairie were plowed and drained; only remnants were left. The population continued to increase. By 1900 it approached 5 million. Eight years later Dr. H. A. Gleason (1908) wrote, "Twenty miles northeast of Champaign is a five acre strip of untouched prairie lying along a stream. It contains a large number of rare species of prairie plants, notably *Cypripedium candidum* and *Lilium umbellatum*. It is highly important that this strip should be preserved and negotiations to that effect are already under way." Thus, over 50 years ago the members of the Illinois State Academy of Science were concerned about the preservation of natural areas. The negotiations about which Dr. Gleason wrote failed and the prairie strip was plowed. Dr. George

Ekblaw told me he helped farm this ground in 1915 and 1916.

After the prairies, the marshlands were drained and converted to fields or home sites. One example is Lima Lake of northwestern Adams and southwestern Hancock counties. Less than a century ago this floodplain lake and marshland served as a vast nesting ground as well as a way station for migratory waterfowl. If we can rely on the reports of old residents, the abundance of game and fish in the Lima Lake locality was stupendous. Where is Lima Lake today? The bottomland that was once the bed of the lake is crisscrossed with drainage ditches; corn and soybean fields now occupy the area formerly covered by water or marsh. In the metropolitan areas, as Chicago, Peoria, and East St. Louis, many of the once vast stretches of marshland now support buildings rather than cattails and waterfowl.

The population continues to increase; it is now over 10 million. The current style of homes demands a large lot with a rambling house. This results in a need for more and more land which means more and more farmland is converted to city lots. Therefore, to provide more farmland or more home sites, or both, more natural areas are destroyed.

Natural or scientific areas are one of the resources of our state. Here the student can study living organisms under natural conditions. The ecologist has long recognized the value of these places, and the systematist is rapidly becoming aware of their importance as a source of living plants and animals for observation. The teacher finds them far su-

perior to pictures as teaching aids. The scientist can use specific plots as scientific check points with which he can compare agricultural and other modified lands. Everyone can gain pleasure and satisfaction, if not a "real lift" from the monotony of concrete and steel, by a visit to a natural area.

To enjoy natural or scientific areas in the future, we must secure them soon or we shall lose them. Fosberg (1958) described this loss when he said, "Drainage, irrigation, scientific agriculture, urban sprawl, grazing, quarrying, strip mining, oil drilling, dams, highways, lumbering, the craze for summer cottages, and other forms of 'development' are destroying the interesting wild places where we like to go, with a rapidity undreamed of even a few years ago." What are some of these wild places in Illinois?

It is gratifying that in Illinois several natural areas have been set aside. A part of Funk's Grove is one such area. Others are Volo and Wauconda bogs in Lake County, purchased by The Nature Conservancy. These two bogs, not in the same stage of development, are of interest because of the type of habitat and the plants and animals found there. In these bogs one may see the pitcher plant (*Sarracenia purpurea*), sundew (*Drosera rotundifolia*), and various orchids including the pink lady's slipper (*Cypripedium reginae*). Except for vandalism, these plants will continue to grow and remain a part of the Illinois flora.

The Illinois Chapter of The Nature Conservancy had its beginning in the Illinois State Academy of Science about 9 years ago. Presently that chapter is actively engaged in

the purchase of another natural area, Rocky Branch in Clark County. This delightful spot is not far from Charleston. Dr. E. L. Stover (1930) published an article on Rocky Branch, and I shall not add anything to his report at this time. Perhaps some of you remember the Academy trip to Rocky Branch in 1952.

I shall not burden you with a long description of every site that should be secured and protected from further man-made changes. Rather, I shall describe a few of the biotic communities and suggest a few significant landscapes and archeological sites which might be considered. Throughout southern Illinois are many places that should be set aside as natural or scientific areas.

Jackson Hollow is located in northwestern Pope County, to the west of Little Bay Creek and the Illinois Central Railroad, the section that is commonly called the Edgewood cut-off. The area of interest occupies about 320 acres.

The beauty of Jackson Hollow, like so many other beautiful localities in southern Illinois, results from the tall cliffs and numerous, adjacent rock blocks which strew the slopes from the cliffs to the creeks. The cliffs and blocks are Pennsylvanian sandstone of the Pounds group. In some places, a layer of shale and coal is exposed beneath the sandstone. The sandstone is subjected to water erosion and, in those places where streams flow at the cliff bases or cascade over the cliffs, huge undercuts, locally called caves, have been formed by the breaking away of large masses of sandstone. Sluggish springs occur in some of the under-

cuts. The small streams of Jackson Hollow flow across beds of sandstone, beds of gravel and sand, and, near Little Bay Creek, through deposits of silt.

The vegetation of Jackson Hollow falls into two chief types, grassland and forest. Grassland is restricted to small prairie openings, often above the cliffs, or to fields of broomsedge which now cover abandoned fields. Forests are of two types. One is the mesic type, with beech (*Fagus grandifolia*), hard maple (*Acer saccharum*), tulip tree (*Liriodendron tulipifera*), and northern red oak (*Quercus borealis* var. *maxima*). The other is the xeric type, with various species of oaks and hickories. The former occupies the space below the cliffs, the latter the dry slopes above the cliffs. Alder (*Alnus rugosa*), river birch (*Betula nigra*), blue beech (*Carpinus caroliniana*), and willow (*Salix*) grow along the streams, especially along the banks of Little Bay Creek. Farkleberry (*Vaccinium arboreum*), a member of the heath family, is common on the stony slopes above the cliffs. The sandstone ledges support numerous lichens, some grasses, and other vascular plants and patches of various mosses including species of *Grimmia*, which are deep green when wet but almost black when dry.

Several unusual or rare plants grow in Jackson Hollow. Filmy fern (*Trichomanes boschianum*) was first collected in Illinois from this location. It grows in two of the numerous overhangs of the sandstone cliffs. The clubmoss *Lycopodium lucidulum* grows in one moist ravine, with rattlesnake plantain (*Goodyera pubescens*) nearby. A number of

other orchids, including puttyroot (*Aplectrum hyemale*), are scattered throughout the hollow. Above the cliffs rock selaginella (*Selaginella rupestris*) and rock-pink (*Talinum parviflorum*) thrive in scattered patches.

I am not a zoologist and I do not propose to enumerate all of the interesting animals of this area. However, on one visit to Jackson Hollow I was within 50 feet of five deer. In one of the "alleys" between the escarpment and sandstone blocks I saw my first turkey vulture's nest.

Presently Jackson Hollow is a part of the Shawnee National Forest. It has been much disturbed recently by lumbering operations. Some trees are marked, however, as nature specimens to be preserved. Let us hope it will be possible to get the Forest Service to preserve as a scientific or natural area not just a few trees but all of Jackson Hollow.

East of Jackson Hollow are a number of localities of interest because of the type of landscape or the rare plants. Some sites are Belle Smith Springs, Sand Cave, Panther Cave, Hayes Creek Canyon, and Lusk Creek Canyon. A most interesting trail could be planned from Lusk Creek westward to Jackson Hollow, or better, to Ozark, a village in Johnson County and some miles west of Jackson Hollow. This trail, which could by-pass the rare plants in the localities to prevent their destruction by uninformed persons, would serve as one kind of recreation for our ever-increasing population.

Cypress swamps still exist in southern Illinois, although they are not so extensive as in earlier times. The public is, perhaps, best acquaint-

ed with Horseshoe Lake and its picturesque bald cypress trees (*Taxodium distichum*) and the huge flocks of Canada geese (*Branta canadensis*). One of the largest bald cypress in Illinois, however, grows in a swamp near Karnak, Pulaski County. The tree is not visible from the nearby highway and is almost inaccessible except during dry seasons. At ground surface the buttressed trunk is 15 feet across and 12 feet above the ground the trunk has a diameter of 5 feet. Associated with the bald cypress in this swamp are tupelo (*Nyssa aquatica*), water elm (*Planera aquatica*), and other interesting, semi-rare plants. One of the animals in this swamp along the Cache River is the otter (*Lutra canadensis*). A similar swamp west of Forman, also along the Cache River, not only has a good stand of bald cypress but also an adjacent mesophytic bluff, at the base of which is a small spring. The mole salamander (*Ambystoma talpoideum*), the spadefoot toad (*Scaphiopus holbrooki*), and the golden mouse (*Ochrotomys nuttalli*) can be seen in this locality.

Pine Hills and the adjoining Wolf Lake swamp is one of numerous natural areas on the western side of southern Illinois. Some of the cherty limestone cliffs tower over 100 feet above the floodplain. The steep slopes just above the cliffs often support prairie, and beyond the prairie is forest. The forest contains short-leaf pine (*Pinus echinata*) and, in numerous ravines, the pink azalea (*Rhododendron roseum*). In the swamps below the cliffs are numerous interesting plants, some of which are swamp loosestrife (*Decodon verticillata*), frogbit (*Limnobium spon-*

gia), and the small duckweed *Wolfiella floridana*. Zoologically, this area is one of the most interesting and important in Illinois. It is the northernmost limit in Illinois of the green tree frog (*Hyla cinerea*). It is the only place in the state where the whistling or bird-voiced tree frog (*Hyla avivoca*) can now be found. It is the locality of the only recent records of the green water snake (*Natrix cyclopion*). The Illinois woodrat (*Neotoma floridana illinoensis*), a peculiar population of the red-backed salamander (*Plethodon dorsalis* subsp.?), and a whole host of fishes, including the cave fish (*Chologaster agassizi*), live in this area. Pine Hills and Wolf Lake swamp are a part of the Shawnee National Forest. Part of the area is controlled by Southern Illinois University and is to be used as a biological station.

Chalk Bluff, perhaps the largest snake den in eastern North America, lies northward along the bluffs of the Mississippi River in Jackson County. Beautiful canyons or ravines extend eastward from the river valley; one of these is Little Grand Canyon, which enters the valley at the north extremity of Chalk Bluff. On the sandstone walls of a tributary ravine is the clubmoss *Lycopodium lucidulum* and also sphagnum moss (*Sphagnum* sp.). It may be difficult to convince the public that this site should be set aside as a scientific area, because from this place the snakes of many different species spread over the countryside. Many individuals would like to kill all of the snakes. To the biologist that would be a vicious act. Our duty is to see that these animals have their

niche in which to live. This place has long served that purpose and it should be protected and preserved. The area is also of archeological interest, especially the southern extremity of Chalk Bluff. How much Illinois history lies buried there, no one knows.

Northward along the Mississippi River valley, the brow slopes of many bluffs support prairie. These are hill prairies—prairies on pronounced slopes. Most of them are on southwest-facing slopes. They are dry and the least disturbed type of prairie. Some of them are grazed and thus modified; others are ungrazed and unplowed and consequently little changed. Fults hill prairie, an example of the latter, is an important scientific area.

Fults hill prairie is located on the bluffs south of Fults Creek, southeast of the village of Fults in Monroe County. Prairie covers about 12 acres of the brow slope of the bluff, which faces southwestward. Prairie spurs on the northwest descend from the bluff-top to a small rock outcrop, below which is a forest on a talus slope. Prairie spurs are separated by coves, most of which support a mixed forest. Prairie on the southeast descends in a broad expanse, covering the poorly defined spurs and coves, to the high limestone cliff. The plants at Fults are the typical hill prairie plants, including such grasses as little bluestem (*Andropogon scoparius*), big bluestem (*A. gerardi*), side oats gramma (*Bouteloua curtipendula*), Indian grass (*Sorghastrum nutans*), and also numerous legumes and composites. Less common species are blue hearts (*Buchnera americana*)

and the bedstraw *Galium virgatum*. The latter also grows on the limestone ledge with the rare *Heliotropium tenellum* and *Mentzelia oligosperma*. The prairie, presently in private ownership, should be secured because of the plants and animals, both common and rare, that are found on this section of bluffs.

Sand covers 4 per cent of the area of Illinois. Six large deposits account for 1,429,000 acres or over 90 per cent of the sand in Illinois. Some of the deposits stretch along the Mississippi River in Carroll and Whiteside counties, and also in Henderson County, along the Green River in Lee and Henry counties and along the Illinois in Mason and Cass counties. Other deposits blanket parts of Kankakee and Iroquois counties and a part of the Lower Wabash valley. Elsewhere there are smaller deposits as, for example, those of JoDaviess, Winnebago, Lake, Madison, and Rock Island counties.

In the first two decades of this century several articles on the biota of the Illinois sand deposits were published by Hart and Gleason (1907), Gleason (1910), Gates (1912), and Vestal (1913). The sand areas these men studied have been converted wholly or in part into fields of wheat, corn, or melons and turkey ranches. More recently some which remained are being converted into pine plantations or housing areas. It is impossible to re-examine some of Gates' plots, as they have been completely destroyed by the construction of a factory. Some of the localities cited by Gleason are no longer extant. Of those that remain, many have been altered, some

very much so, as, for example, the deposits near Hanover in JoDaviess County which are now a part of a United States Government reservation. Once this area was an excellent sand prairie but, for protection against fires, the authorities introduced cattle which soon destroyed the vegetation.

Presently the University of Illinois Foundation owns land in Mason County, some of which is sand prairie and forest. The University is preserving 640 acres of this land as a scientific area. This as a great service to both scientists and laymen. By setting aside a sand prairie in Mason County and several such prairies along the Mississippi River, an important biotic community with its associated species would be preserved. In the Illinois River sands the Illinois chorus frog (*Pseudacris streckeri illinoensis*) and the Illinois mud turtle (*Kinosternon flavescens spooneri*) are endemic. In the sand prairie the prairie deer mouse (*Peromyscus maniculatus*) becomes dominant over the woodland deer mouse (*P. leucopus*). The sand deposits contain some western plant species as *Cristatella jamesii*. In the Mississippi River sands such semi-rare species as rock pink (*Talinum rugospermum*), rock selaginella (*Selaginella rupestris*), and beach heath (*Hudsonia tomentosa*) remain a part of the Illinois flora.

Another type of prairie is that of the floodplains or bottomlands. According to Lewis M. Turner (1934), prairie covered stretches of the bottomlands of the Mississippi and Illinois valleys. Prairie du Rocher, a French village founded in 1722, was so named, according to Thomas J.

Conners, a local historian, now deceased, because prairie vegetation covered not the brow slopes of the bluffs but the bottomland, which was underlain with rock. Only remnants of this type of prairie remain here and there in scattered patches in railroad trackways, along fencerows, or along roadsides. Perhaps this type no longer exists in sufficient quantity to permit the establishment of a natural reserve.

In the definition of a natural or scientific area significant natural landscapes were included. What natural landscapes should be preserved? Among the many which could be considered are cliffs, bluffs, moraines, scenic lakes, and caves. Bluffs and cliffs along the Mississippi River at Elsah are among the most beautiful in Illinois. Will they be there a century from now or will they be blasted away so that wider highways can be built along the river. Do not say that their destruction is impossible. The scenic, narrow, gravel road at the base of the bluffs from Warsaw to Hamilton in Hancock County no longer exists. In its place a modern highway is being constructed to speed the flow of traffic between these communities and save the traveler perhaps as much as ten minutes travel time. But gone forever are some of the scenic spots and biotic communities of that region. Let us hope such will not be the fate of the bluffs at Elsah, nor the bluffs at Stone Face near Rudement, nor those at Lusk Creek near Eddyville, nor at Clark's Run near Utica.

Caves have long interested man. He once lived in them. Cave-in-Rock is now a part of the state park sys-

tem. Other caves throughout Illinois should be protected so the animal life utilizing these habitats will not be exterminated. Caves such as those at Pearl, Burkesville, and Burton could be included as scientific reserves.

Outstanding geologic sections are given very little consideration by conservationists. Whether or not some of these should be set aside is a matter for the geologists to decide.

In the realm of natural or scientific areas I have included archeological sites. In this group are Indian burial grounds or village sites such as the Modoc shelter recently studied by anthropologists from the Illinois State Museum. Careless collectors of relics were once the ones who destroyed such localities. Now the bulldozer in construction work (or destruction work) can destroy more sites in one day than could the careless collector in one month. Anthropologists have attempted to obtain legislation for the protection of these places, which are a part of our heritage and should be protected. So far, the efforts have not been successful.

Having discussed what should be included in the natural or scientific areas, the next question is, "How much land should be set aside for these reserves?" For a suggested amount, I should like to quote a paragraph from the talk of Dr. Hugh Iltis (1958) in Platteville, Wisconsin, to the Wisconsin section of the Soil Conservation Society of America.

"One cannot set arbitrary limits, or even suggest that *every* county should have 10 scientific areas

(though this would be an admirable idea). But even if we think in terms of 1/5 of 1 per cent of the land area of Wisconsin as potential research areas, it would mean an area of 72,000 acres—enough land to go a long way toward insuring continued basic research in land-use science, enough to insure for future generations of students the heritage which rightly belongs to all of those who want to find out the why's and where's of conservation. Where is the industrial concern that would not spend at least 1 per cent of its capital for basic research?"

If we use the same factor that Ittis suggested for Wisconsin, namely 1/5 of 1 per cent, then 72,192 acres of Illinois should be set aside for scientific areas. With some exceptions, this acreage would not include the lands presently in state parks, public fishing and shooting grounds, county forest preserves and the many kinds of picnic grounds, nor should it include new lands acquired for those purposes. The natural or scientific areas are to remain inviolate and used primarily for study of natural conditions. Presently in Illinois about 940 acres—Volo and Wauconda bogs, Funk's Grove, and soon, we hope, Rocky Branch—are dedicated for this purpose. This figure is far short of the more than 72,000 acres suggested.

One valid reason that Illinois does not have such acreage of scientific areas is cost. A committee from Nature Conservancy and other organizations and institutions recently proposed 23 additional scientific areas. The cost for the 3,870 acres proposed is estimated at \$400,000.

The average cost per acre would be \$104. If this is an average that can be applied for the state as a whole, and I doubt that it can, then the total program, the purchase of the needed 71,252 acres to complete the suggested total, would cost \$7,410,208. This is a tremendous amount when one remembers that such sums for purchase of natural areas presently come from voluntary contributions. It is a tremendous figure, a little over the amount received by the State of Illinois during September, October, and November, 1960, from the tax on cigarettes and \$2,497,271 less than the amount received during the same period from the tax on alcoholic beverages.

If the problems of cost and acquisition were solved, another problem immediately looms ahead. It is the problem of protection. Unless some methods are devised to protect the natural areas, they would soon be lost because of outside pressures. This is a serious problem. Some of our public lands are not so well protected as many of us once thought. A few years ago some of us suddenly became aware of the presence of a missile base in one of our state parks. From the legal standpoint this apparently was justifiable as, according to law, lands in the state park system can be leased to the federal government by approval of the Director of the Department of Conservation and the Governor. Natural or scientific areas must receive greater protection from such possible transfers and consequent destruction.

Perhaps it would be better to establish a non-partisan board, with a membership of professional scien-

tists and interested citizens, to manage and preserve the natural areas and to foster or promote study of them. This, of course, would require legislative action. Some states have made progress in this direction, for example, Wisconsin. Illinois has not made progress. Recently I have read a draft of a bill to create a state system of nature preserves. If such a bill were enacted, our natural areas would be protected. Unless a definite plan of protection is enacted, some of our scientific areas will be subjected to tremendous and constantly recurring pressures and eventually they will be lost.

I have tried to describe the present picture. I do not wish to be pessimistic, but how can I be otherwise? Present conditions warrant such pessimism. If we want to preserve natural or scientific areas we must acquire them soon. As the population increases, the demand for space increases. Much of the demand will result in encroachment on the natural areas. These areas must be obtained now and protected now and in the future, too! Five years from now may be too late. Ten years from now, I believe, will be too late. In a decade, most of the areas, unless protected, will be gone and they will be gone forever just as the 5-acre untouched prairie strip in Champaign County is gone forever. Now is the time that the sites must be acquired by gift or purchase. Now is the time suitable legislation must be enacted to insure their protection.

Tempus fugit.

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