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THE DEVELOPMENT OF AN EDUCATIONAL PROGRAM IN IOWA STATE PARKS

I. E. MELHUS, J. L. FULTS AND ELIZABETH A. WHITE¹

THE BEGINNING OF THE PROGRAM

The first state park was created in 1918; consequently the state park educational program is of recent development. Although the educational program and the development of a park system by the state is relatively new, the idea of state-owned lands for recreational purposes is almost as old as our statehood. T. S. Parvin, registrar of lands back in the fifties, advocated in one of his reports that the state should buy a large tract of land in Des Moines to preserve the statehouse ground, for in time the state would need it for recreational purposes. It is evident now that Parvin was at least a half century ahead of his time, because the act providing for the establishment of state parks was passed by the Thirty-seventh General Assembly in 1917.

Probably the first clear statement of the need and purpose of state parks was set forth by Thomas H. MacBride of the State University of Iowa, when in a paper presented before the Iowa Academy of Science in 1896 he advocated the establishment of county parks. He said, "County parks would tend to preserve to those who come after us, something of the primitive beauty of this part of the world, as such beauty stood revealed in its original flora. I esteem this from the standpoint of science, and indeed from the standpoint of intellectual progress, a matter of extreme importance. Who can estimate the intellectual stimulus the world receives by the effort made to appreciate and understand the varied wealth of nature's living forms?"

MacBride so clearly formulated the purpose and scope of a park system that the professional man, layman, and law maker alike saw more clearly the need and were willing to support the movement for the establishment of a state park system.

Another botanist, L. H. Pammel, a man younger than MacBride and employed in a sister institution, the Iowa State College, played an important part in fostering and finally seeing the law passed by the Thirty-seventh General Assembly which made it possible for the State Executive Council to appoint a board of

¹ The authors wish to thank Miss Louise M. Ewan, M. L. Jones and A. O. Simonds for their assistance in the preparation of this manuscript.

conservation to secure and to hold lands for state park purposes. Pammel served as chairman of the first board, organized December 27, 1918, and was very active in formulating policies that have governed the state park movement up to the present writing. The State Board of Conservation was directed to acquire areas having one or more of three distinct qualities—historical, scientific and recreational value. The persons who framed the law had in mind the preservation of animals, rare plants, unique trees, rich geological formations, archeological remains such as the Indian mounds, and rare old buildings where Iowa history was made. They wished to show generations yet unborn what Iowa had in the way of prairie, valley, lake and river, feeling that this heritage was not only for the present generations but also for the citizens of the future. These parks fill an important need for students in high schools and colleges who are invited to make use of the same and are especially valuable for boy scouts and similar organizations.

The law creating the state park movement had two objectives in mind, namely, recreation and education. Much more has been done to facilitate the recreational aspect than the educational phase. Only the educational phase will be discussed in this paper.

As chairman of the State Board of Conservation, Pammel indirectly introduced educational work in our state parks. His primary object, however, was to teach the people of Iowa the intrinsic and permanent value of state parks, rather than to initiate an intensive natural history program. This he did largely through lecturing to groups in the various parks on the history of the park area and writing about the natural history of some of the different parks. His teachings and writings proved to be of inestimable value to the park movement.

INITIATION OF MARKED TRAILS, LEAFLETS, AND PLANT STUDY HIKES

In 1932 an intensive type of natural history education was initiated² by the staff of the Department of Botany of Iowa State College. The authors undertook to find out whether the people living in the vicinity of the Ledges State Park would avail themselves of nature trails and plant study hikes conducted once a week in the park. The program of work was announced through the local papers within a radius of 50 miles of the park. Three projects were undertaken, starting in April and continuing

² The initiation of such a program was suggested and encouraged by Mrs. Henry Frankel, then Chairman of the State Board of Conservation.

through June. First, trails were laid out, along which plants and other natural history materials of interest were marked by especially prepared markers. Second, popular, brief mimeographed leaflets were prepared each week and made available to those who were interested in the educational program. Third, each Saturday afternoon at 3:30 groups of interested people were guided over the marked trails where natural history objects, such as unusual plants, were discussed.

The markers along the trails were changed weekly, and the legends on the markers were so prepared that any one who was interested might cover the trail alone to study the specimens, read the legends and observe the natural history objects. An effort also was made to measure the value of the leaflets by varying their contents, subject matter and form.

The conducted tours were well attended, attendance ranging from 10 to 50 each Saturday. In inclement weather the number usually was low, but there were always some who braved the weather to take part in the program of the day. Students came from all walks of life, but the majority were laymen interested in natural history, particularly the spring flora. Some of those attending the tours drove 50 miles or more to take part in the program of the day. The marked trails proved popular and were used during the week by individuals who went over them alone and studied the subject matter on the markers and the designated objects. The leaflets issued each week proved to be very popular and seemed definitely from the first to have a real place in natural history education in the parks, especially for those that used the trails. To afford some idea of the scope and content of these leaflets, the forewords from the first and third leaflets are quoted.

FOREWORD³

During the next few weeks the Department of Botany at Iowa State College plans to supervise "Plant Study Hikes" at the Ledges State Park every Saturday afternoon, beginning April 23 at 3:30 p. m. Three of the regular college teachers will be on hand to serve as guides. Those choosing to join the hike will meet at the rustic lodge near the west end of the park. Each one present will receive a free study leaflet outlining the tour. Anyone interested in our wild plants is invited to join the class. It will require about an hour and a half to cover the trail. Certain plants

³ Plant Study Hike. Ledges State Park. Issued by the Botany Department, Iowa State College, April 23, 1932.

of special note have been marked with white steel markers. There are 14 of these centers of interest, or stations, where the guide will stop and discuss with the class the plants of special importance.

The leaflet is intended as a guide and a source of information. The route to be covered is mapped and a brief description is supplied of the seasonal and unusual plants that will be encountered along the trail. The station number permits a ready reference to the discussion in the leaflet. Watch for the white markers and the free leaflets each week. A sample copy will be posted on the bulletin board near the lodge.

These leaflets will also be available to those who are unable to join the class any day of the week through the park custodian upon request. The white markers will remain for one week following the supervised study tour. This is done so that anyone may make the tour at his own convenience. It is hoped the legends on the markers and the descriptive notes will stimulate interest in and admiration for the plant life in our state parks.

FOREWORD⁴

The early spring flowers are fast passing and their place is being taken by another class that is somewhat taller, with larger leaves like the May apple, Jack-in-the-pulpit, Solomon's seal, the wild geranium, the columbine, the five-finger (cinquefoil), water leaf and sweet cicely. It is interesting to watch them in their rapid strides from week to week, each adjusting its leaves so as to trap as much sunlight as possible before the cover above them becomes too dense. These taller, leafy, late spring flowers find it necessary to work longer than the early spring flowers. Many of them, as the May apple, Solomon's seal, and the late meadow rue, stay with us until their preparation for the coming year, because the light that comes to them through the tree tops is more diffuse and soil moisture is less plentiful. Sunlight and water are their greatest needs; if they miss either of these, they perish. It is sunlight that tempts the May apple to venture out to the edge of the thickets to struggle with the low shrubs and invading prairie plants for a place in the sun.

The herbaceous plants are not alone in their early preparation for trapping sunshine. Many of the low shrubs that grow in the woods have the same problem as the herbaceous plants and make similar adjustments. The bladder-nut, the trumpet honey suckle,

⁴ Plant Study Hike. Ledges State Park. Issued by the Botany Department, Iowa State College, May 14, 1932.

the wahoo, the choke cherry, and the dogwoods are already well leafed out and working overtime using the sunshine that finds its way through the mostly naked trees. Not only do they send their leaves out early but they choose the more open places and avoid the dense woods and open fields. They are most at home in this park under the oaks and hickories and in openings on steep hillsides, while only a few venture down among the lindens, maples and ironwoods. These associate with the taller plants, the trees, that are tardy in their leaf development so that they may utilize the much needed sunshine before the shade becomes too dense.

The struggle for sunshine is acute wherever plants grow together. This is why plants drop their lower leaves and grow spindly and tall when crowded; why they form leafy rosettes like the dandelion; why the twining vine of the five-leaf ivy, the wild grape and the smilax climb highest into the trees where the shade is less dense. In the rainy forests of the tropics, where there is an abundance of soil nutrients and water, there are many plants that choose to live in the tops of the tallest trees out of contact with the soil in order to be sure to have an abundant supply of sunlight. Plants everywhere arrange themselves into groups based on the struggle for light so that they may make food, grow and reproduce their kind.

LECTURES ON DIFFERENT NATURAL HISTORY TOPICS INTRODUCED
AS AN ADDED EDUCATIONAL FEATURE

In 1933 A. O. Simonds was employed jointly by the Extension Service of Iowa State College and the State Board of Conservation. During this year the educational program was extended to five of the state parks. Hikes, trails and leaflets were supplemented by lectures given by naturalists from many different parts of the state. The lecture programs in each of the five parks were as follows:

Backbone State Park

- | | |
|--------------------|---|
| Saturday, April 29 | Prof. R. D. Noble, "Utilization of Nature Trails in the Schools."
Dr. R. H. Porter, plant nature study hike over marked trail. |
| Sunday, May 14 | Mrs. Grace G. King, "Nature Conservation."
Prof. Fred Lazell, "Birds of the Park." |
| Sunday, May 21 | Mr. James H. Lees, "How the Backbone was Formed." |
| Saturday, June 10 | Dr. A. O. Simonds, plant nature study hike over marked trail. |

- Sunday, June 18 Dr. B. Shimek, "Native Trees of the Park."
 Sunday, June 25 Dr. W. A. Anderson, "The Flowering Plants."
- Dolliver Memorial State Park*
 Sunday, April 23 Dr. J. N. Martin, "Early Spring Flora Including Lichens, Liverworts, etc."
 Sunday, April 30 Mr. W. M. Rosene, "Iowa Birds."
 Saturday, May 20 Mr. T. D. Long, "Nature Conservation."
 Dr. I. E. Melhus, "Iowa Ferns and Plant Nature Study."
 Sunday, June 4 Prof. J. E. Smith, "Earth History of the Park."
 Sunday, June 18 Dr. J. M. Aikman, "Native Trees and Shrubs."
 Sunday, June 25 Dr. Ada Hayden, "Iowa Roses and the Early Summer Flowers."
- Lacey-Keosauqua State Park*
 Sunday, April 30 Dr. A. O. Simonds, "Spring Flowers," and plant nature study hike over marked trail.
 Sunday, May 14 Mr. J. Wilbur Dole, "Birds of the Park."
 Sunday, June 4 Mrs. H. Frankel, "Nature Conservation."
 Sunday, June 18 Dr. James H. Lees, "The Making of the Earth of Keosauqua Park."
 Sunday, June 25 Prof. Charles Carter, "The Late Spring Flowers."
- Ledges State Park*
 Saturday, April 15 Dr. I. E. Melhus, "Early Spring Flora."
 Saturday, April 22 Dr. A. Hayden, "Mosses of the Ledges."
 Saturday, April 29 Dr. I. E. Melhus, Plant nature study hike over marked trail.
 Sunday, May 7 Mrs. H. Frankel, "Nature Conservation."
 Mr. C. F. Henning, "Birds of the Ledges."
 Sunday, May 21 Prof. A. T. Erwin, "Native Shrubs."
 Sunday, June 4 Mr. Jess L. Fults, "The Late Spring Flowers."
 Sunday, June 11 Prof. C. S. Gwynne, "Earth History of the Ledges."
 Sunday, June 18 Dr. J. N. Martin, "June Flowers of the Ledges."
 Sunday, June 25 Prof. G. B. MacDonald, "Trees of the Ledges."
- Pilot Knob State Park*
 Sunday, May 28 Mr. T. D. Long, "Nature Conservation."
 Dr. H. H. Knight, Lecture and field trip to study local birds.
 Sunday, June 11 Dr. E. J. Cable, "Rocks and Earth Formation of the Park."
 Sunday, June 18 Prof. G. B. MacDonald, "Native Trees."
 Sunday, June 25 Dr. S. M. Dietz, "Ferns and Mushrooms."

Many people came to the parks specifically to hear the lectures, and many visitors in the park enjoyed them also. The lecture system was not continued because of the expense to the lecturer. No one received any remuneration or expense money. The lecture feature will prove effective when the parks have park naturalists.

In addition to the above lecture program a splendid series of mimeographed nature study circulars (Nos. 1, 2, 3, 4, 5, and 16)

were made available through the Extension Service of Iowa State College and proved to be very popular. The titles of these circulars were as follows: How plants make food, How plants grow, How plants reproduce, Storage and use of foods by plants, Seeds and seed germination, and Pollination of flowers.

EXHIBITS ADDED AS AN EDUCATIONAL FEATURE

In 1934 the educational program was again financed during the months of May and June by the Extension Service and the State Board of Conservation. Miss Louise Ewan, at that time a graduate student in the Department of Botany, was employed to assist with the educational program. The work plan initiated in 1932 was continued in 1934 with the addition of a new feature—exhibits. These exhibits consisted of an excellent set of photographs of wild flowers, ferns and mushrooms growing in our Iowa parks; a collection of dried and mounted specimens of many of the common plants found in or near the parks; and living plants, flowers, leaves, etc. The latter were held in vases and labeled with their common and scientific names, followed by a brief description of them. In some parks exhibits of tree leaves, ferns, fleshy fungi, mosses, lichens, etc., were added as the season advanced. Exhibits proved to be a worthwhile addition to the park educational program. The flowers and living plants proved to be more interesting than the pictures or dried specimens.

REVIVAL OF EDUCATIONAL PROGRAM BY THE STATE CONSERVATION COMMISSION

From 1935 to 1937 inclusive the educational program was discontinued because of pressure of other educational work on the Extension Service, and because the State Conservation Commission (formerly State Board of Conservation) felt forced to discontinue the cost in favor of a work program sponsored by the Civilian Conservation Corps. In 1938, however, the Conservation Commission resumed the educational program and stationed temporary naturalists in three of the parks during the months of June, July and August. The naturalists chosen were graduate students who received a small honorarium from the Conservation Commission and some graduate credit from the college in which they were enrolled. The recreation division of the Works Progress Administration of the United States Government also employed two men as naturalists in two other parks.

The five naturalists conducted regularly scheduled nature hikes on Sunday and were on hand during the week to answer questions

or conduct hikes by appointment. In the Ledges State Park the naturalist maintained an exhibit in the Lodge and issued four leaflets, "Ledges Nature Notes". Similar natural history programs were carried out in four other parks.

In 1939 the staff of naturalists was increased. Five naturalists were employed by the Conservation Commission and four by the Works Progress Administration of the United States Government for a period of two months, July and August.

The educational program developed in previous years was continued and expanded. In seven parks leaflets ranging in number from one to nine issues in the three months were distributed. Nature trails were labeled and maintained in at least three parks. Exhibits were placed in central locations in at least two parks. The naturalists were called upon to give special talks to groups such as garden clubs, 4-H clubs, boy scouts, campfire girls, etc., that visited the parks.

SELECTION AND PRESENTATION OF APPROPRIATE SUBJECT MATTER

It was observed many times in conducting visitors over a trail that some objects were of more interest than others; also that the labels on the markers were not equally valuable in stimulating interest. These observations showed that the selection and presentation of appropriate subject matter are of very great importance. Consequently these two aspects—subject matter and method of presentation—have received considerable study.

INTEREST IN TRAIL MARKERS

In 1935 a study was made of the value of different types of labels on trail markers by observing the interest of the visitors in the trail marker labels. Between June 16 and August 4 observations were made on eight marked trails that were laid out in the following four state parks: Ledges, Dolliver, Pine Lake and Walnut Woods. A visit was made to the park to select the trail two days before the trail was to be used. Markers requiring 4x6 and 8½x11 placards, and varying from 18 to 40 inches in height, were made and placed by the specimens. Tree markers were fastened to the trees with wire in a few cases. Ten to nineteen markers were used on each trail and were spaced 20 to 130 feet apart. The trail usually was ready for visitors by 9:30 a. m.

A registration book was placed at or near the end of the trail, and near it was placed a placard, "Please Register Here." People were asked to register their name, street or rural route, town and

state. The number of people going on the trail between 9:30 a. m. and 5:30 p. m. was counted and the reaction of the visitors to the various markers was obtained without their knowing it.

The results of observations made of the relative interest shown in the labels on the markers on the trails in the various parks are presented in table 1. The percentage showing no attention was highest on the days when the number on the trail was highest. This may indicate that on these days, which were ideal days for walking and climbing, many people were accidentally on this trail, and on other days people sought the trail with a purpose in mind. It may be said that those who paid attention to some of the markers or slight attention to all of them were accidentally on this trail but that the markers drew their attention. The high figures for this group on July 4 and July 21 were due to the fact that many visitors who had been reading all of the markers turned back after traversing part of the trail because of weather conditions.

Table 1. The number of visitors on the trails and the interest manifested in the labels.

	Number on trail	Number not interested	Number some interested	Number complete attention	Number who studied closely
Ledges, June 16	615	123	123	369	62
Ledges, June 23	701	105	140	456	56
Dolliver, July 4	88	0	26	62	18
Pine Lake, July 7	154	5	15	134	23
Dolliver, July 14	221	2	9	210	33
Walnut Woods, July 21	90	4	54	32	5
Ledges, July 28	162	6	41	115	5
Ledges, Aug. 4	425	34	94	298	9

Sixty percent or over of all the people on the trails were interested enough to read all of the markers, with the exception of one day when weather conditions caused many to turn back. Of these people, about 30 percent studied a few markers closely. Only a few people, as high as 20 percent in one case, studied all of the markers. These few people observed the characteristics of the plant in question, or in case of a comparison they compared the plants in ways other than those suggested and after studying trees labeled they remarked about other trees along the path that were like or unlike those labeled.

About 17 percent of the people on the trails were children, 8 percent intermediate or boys and girls of high school age, and 75 percent were adults (table 2).

Table 2. Percentage of children, intermediates, and adults on the trails.

	Children	Intermediate	Adults
Ledges, June 16	15	10	75
Ledges, June 23	20	10	70
Dolliver, July 4	10	5	85
Pine Lake, July 7	6	6	88
Dolliver, July 14	15	8	77
Walnut Woods, July 21	18	6	76
Ledges, July 28	23	10	67
Ledges, August 4	24	14	62

No definite observations were made on the amount of interest shown by children and intermediates, as the labels were made with the average adult in mind. It was observed, however, that children with their parents usually showed the same amount of interest as the parents. In several cases the child called the parent's attention to something interesting. Two or three children alone either paid very little notice to the markers or were extremely interested. In one instance two little girls about 10 years of age carefully read all the labels and collected leaves for a leaf collection. One boy about 14 years of age took notes from the labels. Two other boys who had been over the trail a couple of times and were there when the markers were being removed expressed their disappointment as they wanted to copy what was on the markers but did not have their notebooks with them.

RESIDENCE OF VISITORS

A large number of the visitors in the Iowa state parks used in this study lived in the state (table 3). Of these, a study of the addresses showed that 90 percent lived within a radius of 50 miles of the park.

Table 3. Residence of visitors on nature trails.

	Number registered	Number from Iowa	Number from out of state	Percentage from cities over 10,000	Percentage from small towns	Percentage rural	Percentage of interest shown
Ledges, June 16	315	307	8	33	57	10	60
Ledges, June 23	401	373	28	16	77	7	65
Dolliver, July 4	30	28	2	10	90	0	70
Pine Lake, July 7	85	79	6	21	62	17	87
Dolliver, July 14	151	143	8	17	62	21	95
Walnut Woods, July 21	25	23	2	60	40	0	36
Ledges, July 28	106	103	3	39	45	15	71
Ledges, Aug. 4	243	231	12	28	64	8	70

The percentages were calculated from the addresses as signed in the registration book. If no street address or rural route was given the name was placed in the small town group. Possibly some of these should have been in the rural group. Likewise with the city group, it was possible that some of these people lived on a farm near the city. For these reasons the percentage under "rural" may be low.

The figures in table 3 show that on two days when the percentage of interest was high the percentage of rural visitors was higher than at any other time. These figures might indicate that there was some relation between these factors, if it were not for the fact that on the two days mentioned less than one-fourth of the visitors were rural. This small number of rural visitors could not appreciably raise the percentage of interest, if a great amount of interest had not been shown by the town and city visitors. On the day when the figures show a small percentage of interest and a small percentage of rural visitors, the low interest was not due to few rural visitors but to weather conditions. On the other hand, there was no relation between the amount of interest shown and the percentage of visitors from small towns and cities. From these data it was concluded that the visitors being urban or rural had no significant relation to the amount of interest shown in nature trails in Iowa.

INTEREST SHOWN IN PARTICULAR LABELS

A study was made of four types of labels, (1) those contrasting or comparing two plants, (2) those describing the plant or giving its habits or botanical relationship, (3) those telling the use of the plant, and (4) those containing a picture. The labels used were as follows:

- No. 1 (a) Virginia creeper. This plant is often mistaken for poison ivy. It always has five leaflets while poison ivy always has three. Look for poison ivy farther along the trail. (Drawing of leaf of each.)
- No. 1 (b) Notice these two trees. The one on this side of the path is a red oak. The one on the other side is a white oak. Notice the leaves and the bark. (Drawings of acorns.)
- No. 2 (a) Horse mint. The flowers of this plant are very striking along roadsides. Like other mints this plant has a distinctive odor and a square stem.
- No. 2 (b) This plant is called pussy toes because it has soft white hairs on the under side of the leaves and stem. It is also called ladies' tobacco.

- No. 3 (a) Bedstraw. Its other name, Galium, means milk as it was used in olden times to curdle milk. Feel the *roughness* of this plant.
- No. 3 (b) Bass wood or linden. A tree whose wood is quite valuable. It is soft, light, tough, and longfibered though not durable. It is highly prized for paper pulp, woodenware and excelsior.
- No. 4 Do you know that most of our grasses have beautiful flowers? This is a picture of our common Kentucky bluegrass magnified fifty times. (Picture.)

Table 4 shows the amount of time spent by 20 persons taken at random visiting the labels mentioned above. Considering the amount of time a visitor spent as a criterion, people were most interested in a marker containing a picture, spending an average of 28 seconds. Next in interest and ranking near the first were those contrasting or comparing two plants. In this case the average amount of time spent by visitors reading the labels was 22 seconds. The visitors were slightly more interested in the economic value of plants than in their characteristics, botanical relationship, etc. When the labels gave the use of plants the

Table 4. Time visitors spent at four types of labels.

	Labels giving contrast		Labels describing plant		Labels giving use		Label containing picture
	No. 1 (a)	No. 1 (b)	No. 2 (a)	No. 2 (b)	No. 3 (a)	No. 3 (b)	No. 4
Time in seconds	15	20	8	6	15	22	20
	12	38	10	15	10	15	40
	18	25	9	8	8	12	20
	12	15	6	5	5	8	25
	12	20	6	6	8	6	18
	21	30	12	10	5	20	35
	18	25	10	12	12	18	20
	8	5	5	5	5	8	12
	18	28	6	16	12	12	18
	12	35	10	15	12	18	38
	10	15	5	6	10	8	20
	16	32	10	8	18	12	38
	18	32	12	10	20	20	35
	20	32	12	8	28	24	30
	25	34	16	15	26	15	32
	22	40	10	18	10	10	35
	26	40	12	16	12	18	38
	22	23	8	8	20	15	35
	20	36	12	10	18	16	25
	18	20	10	8	20	12	20
Total	343	544	189	205	274	289	554
Average for each label	17.1	27.2	9.4	10.2	13.7	14.4	27.7
Average for each type	22		10		14		28

average amount of time spent was 14 seconds, and when only characteristics or botanical relationships were given the average amount of time was 10 seconds.

These data show that certain types of labels held the interest of visitors in the following order: (1) those containing a picture, (2) those contrasting characteristics of two plants, (3) those giving economic value of plants, (4) those giving habits or botanical relationships of plants. The first two types should then be used to maintain a high degree of interest on the trail, but this does not mean that they should be used to the exclusion of the others. Some labels that might not appeal to one person might have a great appeal to another, and a nature trail should have some appeal to every person who might be found on its path.

Another time consuming project was set up on one of the trails. A space of about two square yards was staked off and surrounded by a wire that contained a series of labels. On a tree at one edge of the space was placed a placard bearing the question, HOW MANY KINDS OF PLANTS DO YOU THINK THERE ARE IN THIS AREA OF ABOUT TWO SQUARE YARDS? The series of small labels on the wire bore the names of some of the plants, and a string led from the label to the plants. Of the 162 people on the trail, 56 took time to go around the area looking at the plants and reading all the names. The average amount of time spent here was 85.6 seconds. Though only 33 percent of the people on the trail took time enough to gain anything from this project it was of value to them and perhaps stimulated greater interest than any of the single labels.

INSTRUCTIONAL VALUE OF THE LABELS ALONG THE TRAIL

Did the visitors really learn anything from the labels? The answer to this question can only be ascertained by the comments of individuals. The markers that ranked high from the standpoint of time also drew forth favorable comment. The picture of a magnified grass flower, previously mentioned, revealed something new to almost everyone. Some comments were, "I didn't know grass had flowers," "I didn't know they looked like that," "Can you imagine that they really look like that!" These people had learned something new.

It was interesting to note the comments made concerning the poison ivy marker. The statement, "I'm glad to know what it looks like" was heard over and over. One person said, "I often wondered if that was poison ivy; I thought so, but was never

sure of it." A man said to his wife, "Now take a good look at it so you'll remember it the next time you see it." This marker was considered to be of high instructional value.

The visitors seemed to be attracted by a fungus. "I didn't know mushrooms ever grew on trees," "Aren't they peculiar plants?", "Then a toadstool must be a fungus," were characteristic remarks showing that these people had learned something about a fungus. Many people were surprised to find that puff-balls might be eaten.

People were attracted by a marker concerning something with which they were somewhat familiar. Almost everyone had heard of poison ivy yet not many knew it by sight. To many the fungus was attractive because it seemed an oddity. These facts showed that people were interested in learning something new, and labels that challenged them to learn something new about a more or less familiar plant or introduced a new plant that seemed unusual gained their attention.

DISTANCE BETWEEN MARKERS

Markers were not placed so that specific data can be given on spacing. It was noted on the eight trails that if the people were interested, the distance between labels, which varied in extreme cases from 10 to 130 feet, made no difference. Those who were only moderately interested passed or merely read the top line of the second label when they were closer together than 20 feet. If the labels were around a curve in the path or at such distance that they could not be seen from the previous marker they were sometimes missed. It seemed that markers could be too close together or too far apart, but more study is needed on this point to determine what is the right distance.

SUMMARY

The act providing for the establishment of state parks was passed by the Thirty-seventh General Assembly in 1917.

Pammel initiated the first state park educational program, which consisted of lectures and writings on the natural history of the parks.

In 1932 the Department of Botany of Iowa State College introduced an intensive program in the Ledges State Park. This program was conducted during April, May and June. Nature trails were laid out and marked, mimeographed leaflets were prepared each week and made available to those interested and plant study hikes were conducted.

In 1933 the educational program was financed by the Extension Service of Iowa State College and the State Board of Conservation and was extended to five state parks. In addition to the hikes, trails and leaflets, lectures were given each week by naturalists from different parts of the state.

The Extension Service and the State Board of Conservation again financed the educational program in 1934. The program initiated in 1932 was continued with the addition of a new feature—exhibits. Exhibits consisted of photographs, and dried and living plant material. The living material proved to be the most popular feature of the exhibits.

From 1935 to 1937 inclusive the program was discontinued but in 1938 was resumed by the State Conservation Commission. Temporary naturalists were stationed in three parks. These naturalists conducted regularly scheduled nature hikes each week and during the week were available to offer information and conduct hikes by appointment.

In 1939 five naturalists were employed by the State Conservation Commission and four by the Works Progress Administration. The program developed in previous years was extended and expanded.

A study made of the value of different types of marker labels by observing the length of time visitors spent reading them showed that 60 percent or over of all the visitors who went over the trails were interested in all the markers, and about ten percent studied them closely. The home of the visitors, farm or city, had no significant relation to the interest shown on the trail. That the markers were of instructional value to both adults and young people was learned by noting the comments from visitors.

A study was made of the time spent by visitors at four types of labels: (1) those contrasting or comparing two plants, (2) those describing the plant or giving its habits or botanical relationship, (3) those telling the use of the plant, and (4) those containing a picture. A label containing a picture or contrasting two objects held the interest of the visitors for a longer period of time than those giving the economic value or botanical characteristics.

A label or series of labels consuming more than 40 seconds was valuable to one-third or fewer of the visitors.

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