

DEPARTMENT OF THE INTERIOR
BUREAU OF EDUCATION

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PLAYGROUNDS OF THE NATION

A SERIES OF PROJECTS ON
OUTDOOR RECREATION AND THE CONSERVATION OF
FOREST LIFE DEVELOPED THROUGH A STUDY
OF STATE PARKS AND FORESTS

FOR ELEMENTARY SCHOOLS

By

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, July 8, 1927.

DEAR SIR: Recreational areas in the form of State parks and forests bear a close relationship to the welfare of the boys and girls of America. Accordingly, I have asked Miss Florence C. Fox, assistant specialist in the City Schools Division, to prepare a study of the Playgrounds of the Nation.

This bulletin is in accord with the plan of the bureau to offer, from time to time, to the elementary schools of the country certain subjects of study in the form of new materials of instruction so prepared that they shall stimulate the pupil's interest in the progress of the world about him and shall also be easily adapted to the teacher's daily program. I ask that it be printed as a bulletin of the Department of the Interior, Bureau of Education.

Cordially yours,

JNO. J. TIGERT, *Commissioner.*

The SECRETARY OF THE INTERIOR.

VII

INTRODUCTION

Many attractive areas in the United States are not adapted to agriculture, and just in proportion as they are difficult of cultivation they become ideal locations for State parks and forest reservations. The States are rapidly setting aside as memorials and as playgrounds these spots of scenic beauty. They will remain a priceless heritage to our children and to our children's children as long as the country shall last. Through a survey of these State parks and forests by the boys and girls of the elementary schools a pride in State and National citizenship may be aroused which shall lead to a higher appreciation of this beautiful land which they inherit.

A veritable mine of interesting data for classroom programs can be found in a study of the State parks. What to select out of this wealth of material is a problem. Every phase of subject matter is represented: Lessons in nature study, geography, history, civics, art, and literature. In this bulletin, *Playgrounds of the Nations*, a series of projects are presented which are based upon these subjects of study, as follows: In Chapter I, the relation of people, especially of boys and girls, to the use of the parks and forests for rest and recreation; in Chapter II, the State park and forest as a sanctuary for the wild life of the country which are in danger of extermination; in Chapter III, the conservation of forests; in Chapter IV, the subjects of erosion, mountain folding, and earthquakes, which various parks exemplify; in Chapter V, subjects in history, of the great men for whom the parks and forests stand as memorials. From this classification of subject matter the teacher will be prepared to use the State park as a basis of study and, without difficulty, to incorporate it into the daily program.

Each chapter gives a background of fact upon which the teacher may build her project, supplemented by reading and study to as great an extent as possible. The plan of study which follows the presentation material is based upon actual schoolroom practice which has been carried out successfully in some of the elementary schools of the country.

Silent reading lessons are suggested for each topic, which may be found in the readers in use in the schools, and references to appropriate stories, songs, poems, and pictures are given, followed by refer-

ences for teachers for use, in supplementing the actual material found in the bulletin.

The reading lessons listed under each topic for Grades III, IV, V, VI are taken from a large collection of readers that are now in use in the schools of the United States. The list is comprehensive for the purpose of giving the teacher with even a small collection of supplementary readers an opportunity of using reading matter already at hand without formulating lessons of her own. With so large a list from which to choose, there will undoubtedly be some books which are included in any teacher's collection of supplementary readers. These lessons may be written on the board or may be typed or mimeographed for the use of individual pupils in classes in reading.

PLAYGROUNDS OF THE NATION

Chapter I

LESSONS IN CIVICS

Rest and Recreation

State parks are created for the use of the boys and girls and the men and women who desire to spend a day, a week, or perhaps a month in the great out-of-doors. All State parks provide for the comfort and pleasure of groups of people who are in search of rest and recreation.

Summer and Winter Camps

Every boy and girl loves a picnic, and to camp for a few days in the woods means a succession of delightful picnic experiences. Children love the trees, the water, and the secret wild life they discover in the quiet nooks and corners of the forest. To find a bird's nest hidden away in some secluded spot, to spy out the pink blossom of the arbutus under the leaves, are experiences which the child remembers always. To become familiar with the haunts of birds and animals in the woods and to understand their ways of living become most cherished memories.

Fifty thousand children, nearly half of them girls, were in camps in 1926; many of them were in State parks and forests, which offer special opportunities for this type of camping. These children were under the care of trained directors and councilors, who had charge of the swimming, canoeing, nature lore, and arts and crafts lessons which each child received during the last 8 or 10 days of June. While the children were not coerced in any way and could freely choose the activities they most enjoyed, there was a definite aim among the directors to plan the children's program in such a way that good habits of right living might be formed.

Hygiene.—Some children come to camp not weighing as much as they should. Some are susceptible to colds and are troubled with loss of appetite and with indigestion. Under the influence of the

simple, active, outdoor life in camp these handicaps tend to disappear. Round backs are straightened, stooping heads are lifted, overweight children with flabby muscles become strong and wiry, and the undernourished child takes on flesh and acquires a normal appetite. Most children develop sounder and better trained bodies and—quite as important—they become more self-reliant and are able to face their difficulties and dangers with greater courage and independence.

Boys' and girls' clubs.—Perhaps no organization in the United States makes greater use of the State parks than the boy scouts. In the Harriman section of the Palisades in New York upward of 20,000 boys spent their vacations there in 1925. The camps accommodate 3,100 boys who come and go during the summer at fortnightly periods. They are housed in wooden buildings and in tents which they use in winter for week-end and winter holiday outings. In the

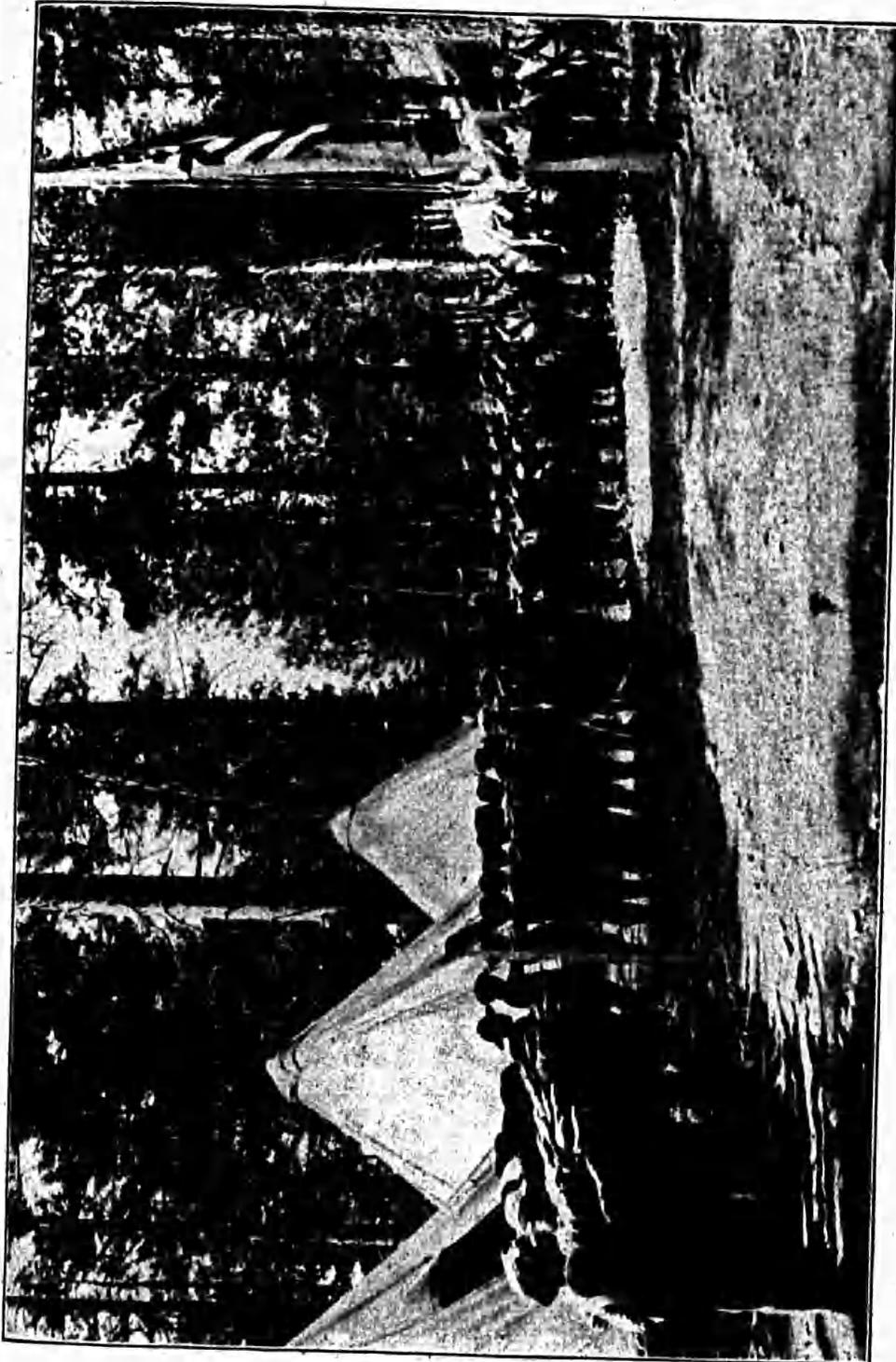


The evening fire, Camp Fire Girls' summer camp

summer the boys hike and swim and carry on their regular scout program. In the winter they skate, toboggan, snow shoe, and ski on the neighboring hills near their camp, in addition to their usual scout activities.

Nature trails.—The Girl Scouts, the Camp Fire Girls, and the Woodcraft League, and many other clubs for boys and girls, are using many of the State parks not only as camping grounds but for the out-of-door training walks which have become a part of their nature work. These nature trails cut across the country from one point of interest to another, over hills and through the woods, beside the streams and into the depths of the forest. Objects of note or of special interest are marked and labeled and serve as guide posts for the "trailer." Writes a girl scout of a winter trail in the Adirondacks:

When you get into the open, make the most of your views. It was great sport following the trail in the winter, because we had to identify it by close observation of trees and rocks. On the left was the Hanla birch, a little farther to the right the Den of Rocks, and then the Scotch fir and a sweeping outlook



A Boy Scouts' summer camp—Saluting the flag

over the valley. On the way we saw rabbits and rabbit tracks and foot prints that we thought might have been those of a fox. The snow is great for observing animal tracks. If you can get out into untrammelled country, wearing galoshes, you find things you didn't dream could be there.

In some of the camps every sort of growing thing is marked along the nature trail. Life histories of insects are illustrated by specimens hung in bottles on the trees, and other growing objects are labeled with linen tags marked in water-proof ink. Plaster boxes with removable glass tops are used for ground insects, and glass tubs for small aquaria holding salamanders and snails. In one camp conducted by the institute for the blind the blind campers learned to distinguish as many as 17 trees by feeling their bark and tasting the twigs, as many flowers were identified by their sense of smell, and birds by their notes. Stuffed birds were brought to this camp so that campers might feel and learn to distinguish their size and shape.

The half-hour before supper and the evening hour around the camp fire are the popular times for a discussion of the various finds which the boys and girls bring in from their nature hikes. Many lessons are learned that change the child's attitude toward the world of nature around him. His aversion to harmless snakes is often overcome, his impulse to destroy becomes a desire to protect the wild life he has come to know more intimately. The bird's nest remains unmolested; the tiny insects under his careless feet are unharmed after he has watched a member of one of these insect families develop in the aquarium and he has been given an insight into the plan and purpose of its daily life.

Park museums.—Sometimes an open-air museum is established in the camp, where the specimens gathered on nature hikes may be placed on exhibition. Such collections have become of great interest to other visitors in the parks, and when the material has seemed of sufficient value a permanent building has been put up to hold the exhibit. Mr. Hamlin, president of the American Association of Museums, suggests an alternative for the labeling of trees. He says:

Trees should be labeled—not too much. I should put up a sign saying: "Within 50 feet of this locality you will find certain trees," and then make the intelligence of the visitors do your park work rather than just put your labels on the trees themselves. Follow a trail a quarter of a mile long with questions along the way, the answers to which will act as a nature guide.¹

Focal museum.—To treat the park itself as a museum is another move in the direction of intelligent nature study. Mr. Hamlin suggests the focal museum as an additional help. He would arrange for observation platforms overlooking some attractive or specially interesting bit of scenery which is not easily within reach of the visitors to the park. Telescopes permanently mounted on an overhanging balcony will enable the sightseer to bring the view close to the eye without inconvenience or danger to himself. Niagara Falls State Park in New York is to have a focal museum which will also tell

¹ From *The Playground Magazine*, February, 1926.

the history of the falls to the hundreds of thousands of people who annually make a pilgrimage to our greatest scenic attraction.

Arts and crafts.—That arts and crafts should find a place in a boys' or girls' camp in a State park seems most appropriate. Every sort of material is at hand for use in a woodcraft program. In fact, each member of a club is expected to fashion with his hands a number of projects for which he receives credits in his organization. The Camp Fire Girls Handbook suggests the following list of campcrafts for a summer camp: Rustic furniture, bird houses, bird baths, fireplaces, open shacks or shelters, tree houses, boats, bows and arrows, bark cups and baskets, rush mats, bridges, fire sets, paddles and their



A girls' class in woodcraft in one of the 4-H camps

decorations, rude cooking utensils, and sun dials. The 4-H Clubs, which claim 600,000 members and whose camps numbered 1,800, with 114,000 boys and girls in attendance in 1925, have a woodcraft program in addition to their many other activities in farm work and housekeeping. It is estimated that in the past 10 years 5,000,000 boys and girls have been trained in some form of outdoor recreation in the 4-H club—Head, Hand, Heart, and Health Club—alone. Then what shall we say of the Woodcraft League and their council ring; the Audubon societies and their efforts to interest boys and girls in the beauty and value of wild life and animal life; and the Girl Scouts and Boy Scouts with their basic idea of out-of-doors life and nature work? How important it seems that the State park move-

ment should expand and grow, offering as it does the woods, the streams, the hills, and the valleys for the use of this mighty army of young people who are seeking to know and to feel the enchantment of out-of-door living and recreation.

Picnic camps.—Picnicking is the simplest form of camping and, for the children, the most delightful. "Let's go on a picnic" has a magic sound even to a grown-up, while for the child it fills his soul with ecstasy. The picnic camp ground in our State parks has a few necessities with which it is equipped for the use of those who are spending a day in the open. One of the first of these is a pure water supply, then a sanitary toilet, open ovens for warming or cooking food and making coffee. Firewood, tables, benches, and



Tourist's camp equipment: Open-air stoves

refuse cans are also needed. A shelter of some kind, which may be used for parlor games and dancing, is almost a necessity. The camp is usually in the shade under the trees with some open spaces for athletic games and contests. A few pieces of play apparatus for children are included, swings, tecters, and a slide or two. Water for swimming and boating is provided if possible.

Tourists' camps.—Camps to provide for the traveling public are somewhat similar to picnic grounds which serve a public from neighboring towns for a day only. They are, however, arranged on a much larger scale and are usually laid out like a small town or village. In some parks the following plan is adopted. Each lot covers 1,600 square feet, which allows 27 lots to an acre. When the tourist drives on this lot, unpacks his kit, and puts up his tent, he and

his family are at home for the length of time they occupy it. Their lot is their homestead and trespassers can not encroach upon it.

In many State parks a shelter house is provided which is equipped with toilet, shower bath, and laundry facilities, and a large lounging or clubroom with a fireplace where, in cooler weather, a log fire brings comfort and cheer to the weary traveler. In addition to these luxuries, the out-of-door equipment includes open-air ovens, tables, benches, refuse cans, firewood or gas heaters, and in larger camps an incinerator. For exercise and recreation a few pieces of playground apparatus for the children are provided and a ball ground, tennis court, volley-ball court, croquet and horseshoe courts for the older children and adults, with places for swimming and boating, wherever possible.



Open camp shelters and fireplaces permanently placed in many camps

Shelters.—In some State parks open camp shelters and fireplaces are permanently placed which can be used from season to season. The sleeping quarters are sometimes tents, tent-cottages, or cabins. It is desirable that each camper should have 50 square feet of floor space and 500 cubic feet of air space. The floors should be raised from 10 to 18 inches above the ground in all sleeping quarters and one side left entirely open, protected by canvas curtains or windows on pulleys.

Open-Air Sports

Hiking.—A State trail is a carefully selected strip of land which the State maintains as a cleared footway for the use of pedestrians.

It takes the hiker over hills and through valleys wherever an attractive view is disclosed or where some special object of scenic beauty can be seen.

Khaki knickerbockers and high-laced shoes, with loose flannel shirt, is the most suitable dress for hikers, both men and women. Soft caps with visors to protect the eyes from too much sunlight will add to the comfort of the trailers. The kit should contain two or three cooking utensils and the necessary blankets for out-door sleeping. A good bed is a long narrow bag made of bed ticking,



Hiking

about $2\frac{1}{2}$ by $6\frac{1}{2}$ feet which may be filled with dry leaves for the night and emptied in the morning. It is well to have a rubber blanket to spread under the tick and two light woolen blankets for covers. A small shelter of canvas to protect one's head from the wind is almost a necessity.

Fishing.—Most of the State trails follow water courses, as trails have always done. These streams are well stocked with fish (see

Chapter II) either by nature or by the State fish commission, and one of the delights of hiking is to capture a bass or trout ~~in~~ the fly, so to speak, and to broil it over the coals for supper. A bed of hot and glowing embers, rather than a flaming fire, is needed for broiling the fish, and this can be secured by building up a cone-shaped pile of dry twigs around a few dry shavings before lighting.

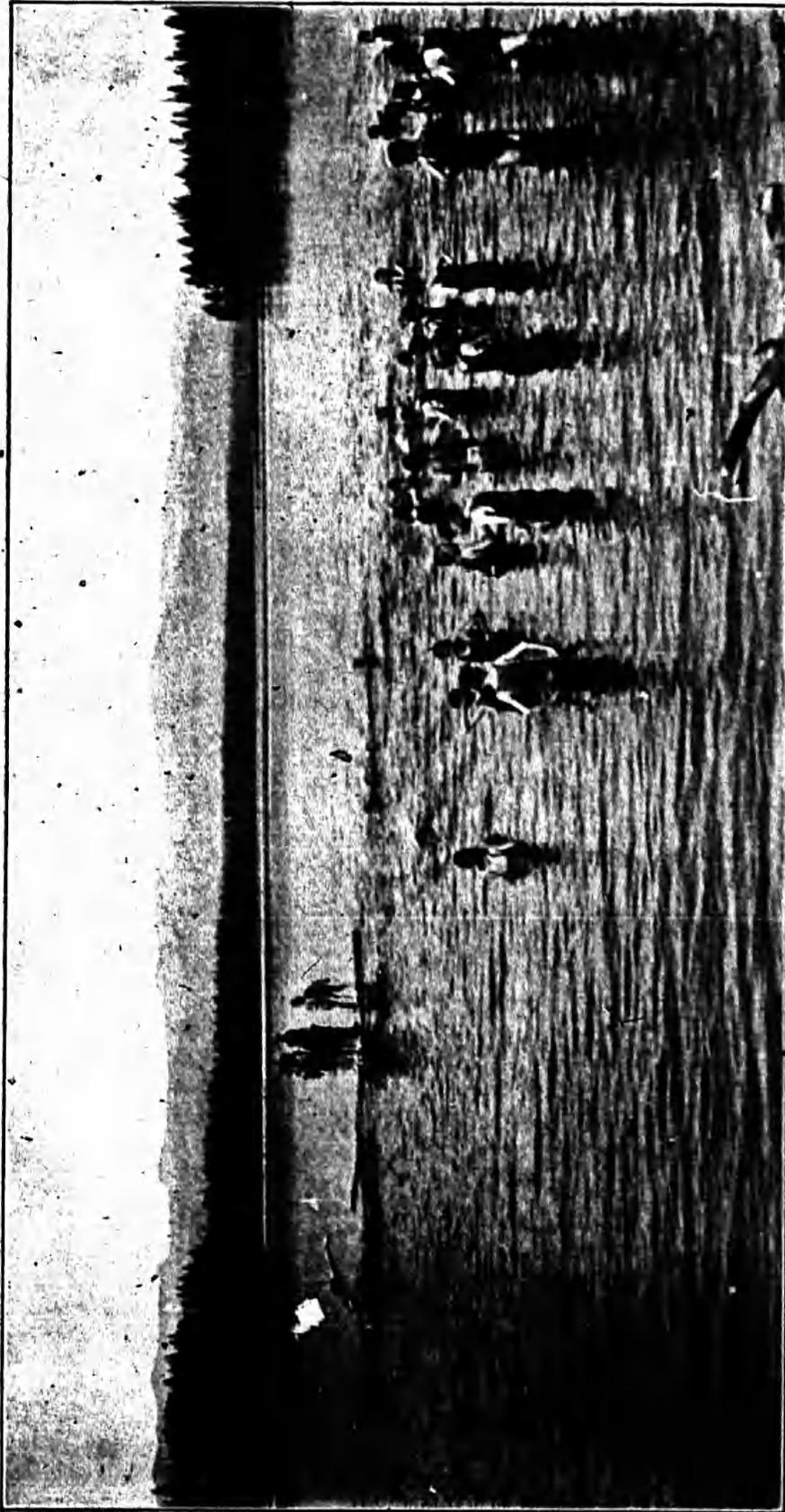
Swimming.—Most State parks try to provide some facilities for swimming and canoeing. In the case of boys and girls a director is needed not only to teach the art of swimming properly but to safeguard against accidents. The new strokes in swimming should be taught as well as the old-fashioned breast stroke and side stroke. Within the past 10 years the modern crawl stroke has become quite popular.



Fishing

Canoeing.—Perhaps the most enjoyable of all water sports is canoeing. It is an easy way of carrying campers and their duffel on trips away from the home camp and is an excellent exercise in physical development. The kneeling position is recommended for expert canoeists by directors, as it gives freer play to the muscles than the sitting position. When one becomes used to it there is no more fatigue experienced than by the sitting position. There is less danger in the sitting position for beginners and for children.

Games.—There is no better place for outdoor games than in a State park camp, where open spaces of sufficient size abound for almost any form of outdoor activity. Baseball appeals to both boys and girls and is a never-ending source of enjoyment. Basketball



Boy Scouts swimming

requires very little apparatus, and that is easily transported. As this game seems destined to become one of our national pastimes, and as its use develops every muscle in the body, it should be encouraged in every camp where boys or girls congregate.

Running, jumping, and hurdling create a healthy spirit of competition in the camp, but there is always danger in these athletic competitions of crowding out the weaker and less developed members who are really in need of the exercise more than those of greater prowess.

An English game which is becoming popular in some of our eastern camps is field hockey. The technique of this game is rather difficult to acquire, yet it seems to be gaining a popular place on our programs of outdoor recreation.



Girl Scouts canoeing

*Helpful Camp Suggestions*²

1. Choose your camp site well. It should be a fairly open spot, level enough for the tent and camp fire, but elevated enough to have good natural drainage. It should have exposure to direct sunlight during part of the day, especially during the early morning hours. In summer, exposure to whatever breezes may blow is desirable.

2. Many campers make the mistake of selecting a camp site solely for its attractiveness, say in a cozy nook beneath the shade of large hemlocks and close by a stream side; this often results in poor light, poor ventilation, undesirable moisture conditions, and annoyance from mosquitoes and other insects. It is better to build high and dry.

²From "In Penn's Woods," Bul. 31, Pa. Dept. of Forests and Waters. R. Y. Stuart, secretary, Harrisburg, Pa. April, 1923.

3. Remember that your tent is to serve as a shelter rather than a dwelling place while you are in the woods. Considering its service as a shelter, it deserves less consideration than the out-of-doors where the camper spends the enjoyable hours that make camping worth while. It is not necessary to pitch your tent in the most beautiful forest recess. Often it is better to keep such places for visitation.

4. Always locate near an ample supply of pure water. While a spring is desirable, the average sparkling mountain stream, bubbling over a rocky course and receiving a plentiful supply of sunshine, can be depended upon as a source of potable water. A hike upstream for a survey of its condition is well worth while before final selection of your camp site. It furnishes a unique feature to the many ventures of a camping trip.

5. Plain, simple foods form the best fare of the forest recreationist. The greatest food value, together with the least bulk, is the first rule of his diet. His rations should consist of foods that are easily carried, easily kept, and easily prepared. The preparation of the camper's meals is, nevertheless, an art worthy of the experienced. The bulk of his food supply for a given period should average not more than $2\frac{3}{4}$ pounds a day per man. See books on camping for detailed information on menus.

6. The miscellaneous equipment of the camper, besides his mess and toilet articles, should be very little. A sharp pocket knife of the "Boy Scout" type, a sharp hand ax, a dry match case, and a first-aid packet should always be taken. A book on camping suggestions, containing first-aid rules, is recommended to every forest camper. Field glasses, pocket lens, a canteen, and a compass may be desired, according to the individual. A durable notebook and several pencils should certainly be carried by every forest user, in which notes and sketches may be made. The latter, even though simple, will be of great value for future reference. A small camera that takes good pictures may also be a valuable addition to the necessary equipment.

7. Every forest camper needs a cook fire, and most will have a camp fire, too, for evenings. He must know how to build them, the materials to select, how to protect the fire from spreading into the forest, and what to do if it should spread.

8. Before starting your fires, gather together a sufficient supply of suitable materials. Stuff of mixed sizes is desirable—dry leaves, shavings, twigs, bark, splitwood, and finally round logs. Remember that a thick piece of wood will not take fire from the quick blaze of a few leaves that are soon consumed. In damp weather it

is advisable to make a good supply of dry shavings with your jackknife.

Build up a small cone of twigs about the shavings and, when the fire takes well, larger material may be laid across it and the cone shape broken down. *It is a bed of hot and glowing embers, rather than a flaming fire, which is needed for cooking.* For the camp fire, on the other hand, the cone may be enlarged to as great size as safety will permit.

It is often convenient to carry a set of 8 to 12 straight, stiff, iron rods from a foot and a half to 2 feet in length for the gridiron. These rods should be carried in a long, narrow bag into which they fit neatly. In use these are laid across the fire from two logs or stones on either side. A simple and serviceable substitute for these rods are two flat irons about one-eighth of an inch in thickness, 1 inch wide, and 2 feet long.

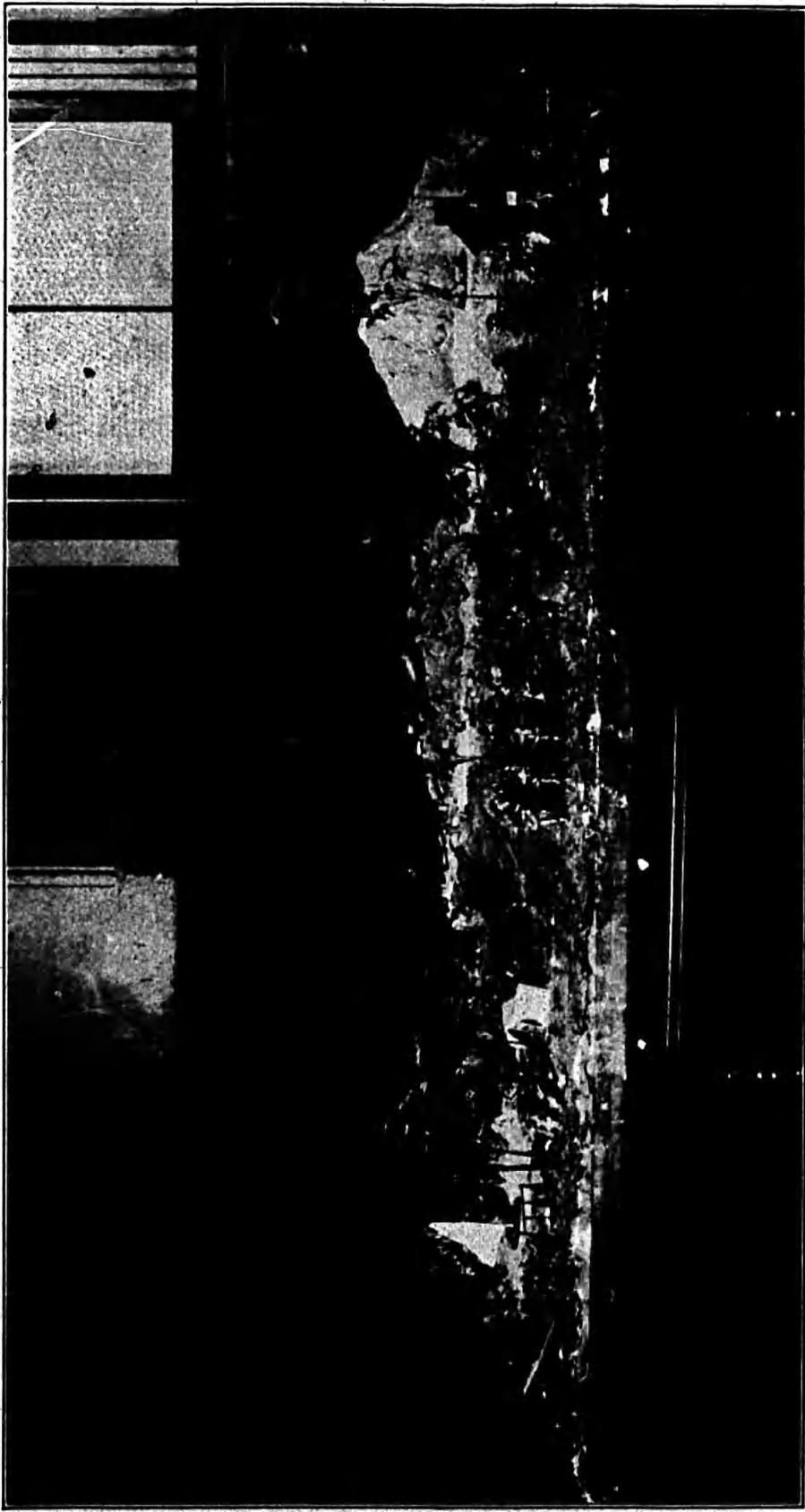
A State Park Building Project

Plan of study.—Perhaps the best method of approach to the study of the State park in elementary schools is in a building project by the children. The foundation may be of sand and the building done on an ordinary sand table, if a temporary project is desired. If a permanent exhibit is required, as was the case herein described, then metal lath and plaster of Paris should be used for the foundation.

This building project of a State park was the work of a group of fourth-grade pupils who had just entered the fifth grade. It is an illustration of the possibilities which a project of this kind offers for the cultivation of sustained interest and concerted effort on the part of a class of children. These pupils had little skill in handwork and none at all in clay modeling. Yet the figures modeled by them will compare favorably with similar work in other classes in the same grade. The reason for this may be attributed to the absorbing interest in the work and the desire to do the work well which was characteristic of the entire group.

The project represents the use of a State park for rest and recreation, for bird and animal sanctuaries, and for the conservation of forests. As the work progressed, each object was painted in oils with colors as true to nature as possible. The background was treated in the same manner. The trees and grass were painted green, the cliffs gray, the water blue, and the animals and birds as nearly like the originals as possible.

In the background of the picture is represented a low line of wooded hills that afford a suitable cover and feeding ground for the wild animal life of the forest. At the left a herd of deer and elk are feeding and a group of mountain sheep are standing under the trees



A State park building project, fifth grade

on the hill in the middle distance, while a few bison can be seen at the right just above the river. A stream flows along the foot of these hills from the mountain lake at the upper right to the small pond at the upper left, where water birds and water animals of all varieties find a sanctuary. The wild land birds find their cover just below the pond in a small valley between the hills at the left. The conservation of the forest itself is represented by the observation tower perched on the cliffs at the upper right, and the forest ranger and his house and barn at the lower right. Masses of wild flowers of many tints and shades are scattered throughout the forest.

In the foreground a variety of recreational activities are going on. At the lower left is a small lake for sailing and bathing, with the sailboat in the center and the bathers seated under umbrellas on the farther shore. In front of the lake the play apparatus is placed, consisting of swings, crossbars, and a slide, down which one of the picnickers is sliding. The picnic party are near the lake just in front of the tents and are busy spreading out the food and preparing their picnic dinner. In the middle foreground is a group of boy scouts taking their exercises under the direction of their leader. Behind them are the shelter tents they use in stormy weather and just back of them to the right is a small fishing party preparing to fry the fish which one of them has caught in the stream and is bringing to the fire to be cooked. The forest ranger on his horse in front of his house is preparing to ride over to the observation tower to see if there is any sign of fire in the forest. The lone boatman in his canoe on the mountain lake seems to be paddling around in the water and enjoying the scenery.

Materials and technique.—Pictures are indispensable for this work, because no group of pupils will be able to acquaint themselves with all the details through field lessons, even if a State park should be near at hand and easy of access. It is understood by the teachers and pupils that this project is a composite view of a State park containing most of the features found in all of them. Many of the pictures needed can be found in illustrated magazines, and so far as possible should be brought in by the children. This enhances the interest and gives a sense of responsibility and also enlists the cooperation of the parents.

The foundation of the project consisted of metal lath shaped to the desired contour and then tacked firmly to a wooden platform. Over this several pieces of burlap soaked in a thin solution of plaster of Paris were firmly pressed until they hardened over the frame and held it in place. It was possible to insert the wires which were attached to the models of animals and figures through the meshes of the burlap and to mount them firmly in this way.

The gathering of nature materials for the trees and flowers and the rocks was done almost wholly by the pupils on Saturdays, and they were brought into the class on Monday morning. The use of this material showed a considerable amount of originality and resourcefulness. Dried sprays of goldenrod found along the roadside were used for the trees. These were dipped in shellac and when dry were dipped into green paint. They represented almost perfect elm trees in size, shape, and color. The wild flowers were dried seed cradles dipped in shellac and then into a variety of colors.

Clay figures were copied from pictures as models and were reinforced with toothpicks inserted in the clay. No attempt was made to model hands or feet or the features of the face, but the pose of each figure was carefully studied. When the clay was thoroughly dry it was dipped in shellac and then painted the desired color. Tents were made from the corners of boxes and painted. Very thin tin, easily cut, formed the canoe and the slide in the play apparatus. The former was pinched together at each end and sewed with wire after holes had been punched through the edges. The sailboat was carved from a block of wood, and the cloth sail was attached to a wooden mast inserted in one end of the boat. The kindergarten furnished the forest ranger's house and barn and the lookout on the cliffs. They were cubes and triangles of wood with tin roofs. The tower was an oblong with steps up the sides cut from kindergarten splints with a tin roof over the observation platform. All of these were painted a dark maroon and trimmed with yellow.

Subjects of study.—In connection with the building project the lessons in history, geography, and nature study should be given. These form the best possible bases for language lessons, arithmetic, and reading exercises.

The child's home State is the center of interest throughout the entire study. The heroes of his State, the geographical attractions, the flora and fauna, all offer opportunities to the teacher for cultivating in the child's mind a type of patriotism which will especially appeal to children of the middle grades, and which will lead later to a finer appreciation of the Union of States which constitutes the country in which he lives.

Chapter II

STATE PARKS AND FORESTS AS SANCTUARIES

Sanctuaries for Birds

The State park and the State forest are essentially sanctuaries. They are places set aside where forms of wild life, especially those that are in danger of extermination, may be preserved for us, our children, and our children's children as long as our country shall last. Some of our most valuable birds and flowers and animals have disappeared within our own time and will never be seen again, for when a species has become extinct no power can reproduce it. It is gone forever.

Slaughter of the passenger pigeon.—The passenger pigeon is the most remarkable instance of the extermination of a species of wild life that has been known, because it occurred in a very short time and also because there were such countless numbers of these birds throughout the United States that no danger of their extermination seemed possible. Many attempts were made to induce the State legislatures of the Middle West to pass laws protecting them, but these bodies of men thought it was unnecessary, and consequently this beautiful bird has been utterly destroyed. The last specimen died in 1914 in the Zoo Gardens in Cincinnati, Ohio, where she had been carefully guarded for many years. The effort made by the State of Ohio to find a mate for her through a standing offer for several years of \$1,000 and the attempts made by scientists to locate another pigeon of this variety make a story that reads more like fiction than like fact.

Surprise is often expressed over the speedy extermination of a species that multiplied so rapidly as this pigeon, for while they laid only one egg at a setting they usually reared a chick each month of the year, in the Northern States in the summer, and in the South in the winter. They passed over the country in long flights from one feeding ground to another, stopping at their regular nesting places to raise their young. Audubon computed that the continuous stream of pigeons he saw on one of many occasions must have included more than 1,100,000,000 birds that would consume more than 8,500,000 bushels of grain daily. Alexander Wilson, the father of ornithology,

states that he estimated a single flock to be 240 miles long and over a mile wide. The great Chief Pokagon, the last chieftain of the Potawatamis, wrote a report for the Chautauqua of a flight which he witnessed about the middle of May, 1850, while camping on the headwaters of the Manistee River, in Michigan. He says that the air was filled with them and that the light of noonday was obscured as by an eclipse. The sound of their passing is described as a gurgling, rumbling sound, as though an army of horses laden with sleigh



The last passenger pigeon: A bird without protection

bells was advancing through the forest. The uproar of the birds arriving could be heard 3 miles away.

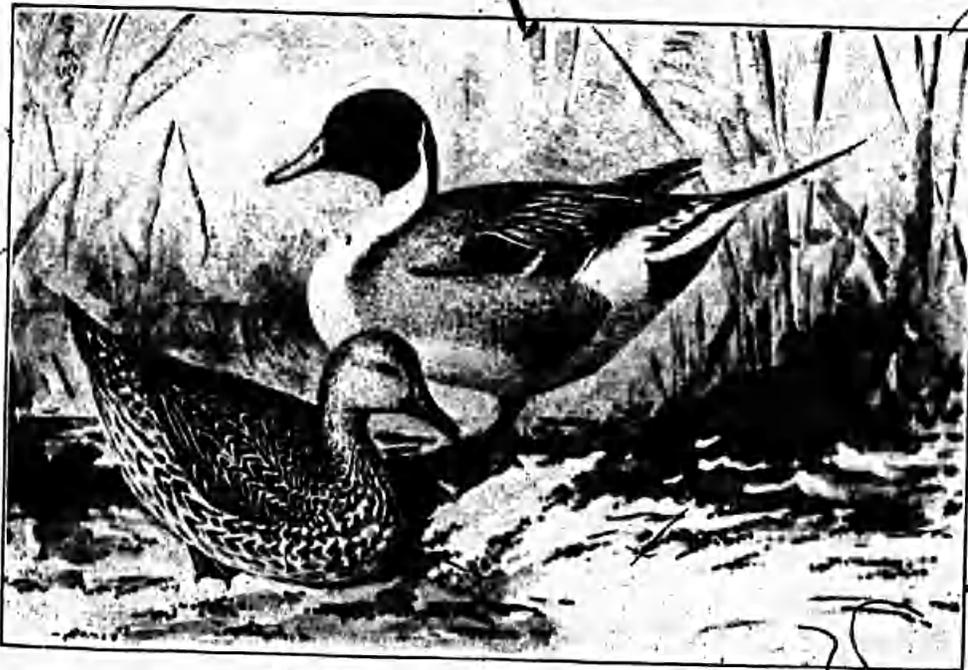
Whenever the pigeons appeared in great numbers the inhabitants armed themselves with guns, clubs, stones, poles, and whatever could be used to destroy birds and as soon as they lit the slaughter began. Large nets were used, grain beds were made, and the birds allowed to come and feed until from 200 to 250 dozen were sometimes taken at one haul. How was it possible for man to kill them all? It was not necessary to do this for the young birds were selected for the general slaughter because they brought a higher price in the market and were more easily taken. They were killed before they were old

enough to raise chicks and carry on the species. Thus passed the passenger pigeon, a bird without protection and without a sanctuary.

Game Birds

Causes of extermination.—Grouse are diminishing in every part of the United States where they were once numerous. They can not stand the ordinary destruction by natural causes and by guns at the same time. Fully 5,500,000 guns are now busily at work each hunting season on our grouse, woodcock, snipe, quail, shore birds, and the most of the living blanket of ducks and geese that once covered the area from the Atlantic coast to the Pacific.

Laws that protect these birds from the gun would save them from extermination if their feeding and breeding places could be pre-



Pintails: Left, female; right, male

served. The ground cover that once offered them food and safety has been largely destroyed by the spread of agriculture. It is said that the wire fence is largely responsible for the disappearance of the quail. The clean farm cultivation and the clearing-up of every inch of land has left the quail without the rail-fence corners which afforded ideal cover for feeding and breeding.

The prairie chicken has suffered more than most birds from loss of food and covers. The prairie grasses, the wild rose, the wild sunflower, and many other food plants are often destroyed on the big wheat farms where these birds formerly were abundant and where they are now extinct.

State park refuges.—In the State park lies the great opportunity for the State to save the birds from extinction. Every State park

of any size will eventually become a refuge for valuable game birds. Already they are finding a sanctuary in many of them. Departments of conservation are established, commissioners are appointed, and wardens are selected to patrol these refuges and to insure the birds against molestation.

Food and shelter.—Areas are made attractive to the wild life by the planting of nut and fruit trees and shrubs on the uplands, and food water plants in the marshes and shallow lakes. Natural foods for wild life can be increased at little expense. Many dealers are now making a point of supplying valuable food shrubs and trees and water plants for these refuges.

The relation of one form of life to another is aptly illustrated by the discovery that woodcocks can be brought into the alders and birches by pasturing cattle there, as this brings in the earthworm, which is the principal food of the woodcock. Joseph Grinnell, the well-known scientist, writing of this relationship between various forms of forest life, says:

I wish now to point to the far-reaching interrelation of all the living things in the forests. There can be no snappy and full-fleshed trout in the brook without adequate insect life to feed upon. There can be no insects without suitable food for their subsistence. There can be no singing finches and grosbeaks in the glades without seeds and fruits for them to feed upon. There can be no warblers in the tree tops unless there be an unfailing supply of "bugs." There can be no foxes and weasels to thrill us momentarily when we come upon them without rodents for them to feed upon. There can be no gay and frisky chipmunks without seeds to feed upon. There can be no seeds unless the annual crop of vegetation has been left to mature.

Not only does the forest area afford the means of existence for a great number of individuals, but I am led to believe the forest trees themselves depend for their maintenance in the condition in which we observe them in this age of the world upon the activities, severally and combined, of the animals which inhabit them now and have inhabited them in the past. The pocket gophers, the ground squirrels, the moles, and the badgers are natural cultivators of the soil. It is in considerable degree the result of their presence during long series of years that the ground has been rendered suitable for the growth of not only grasses and herbs but even of shrubs and trees, particularly in the seedling stages of these woody plants.

Shelters are maintained in the State parks in the form of natural cover. As much as possible the refuge area is left in the natural state for the protection of wild life in the stress of winter. An effort is being made to foster the spread of the native turkey, the finest of our North American game birds. In the Roosevelt Reserve in Ohio wild turkeys are given special care and attention and these birds are increasing rapidly. In one refuge a flock of 15 birds was brought in which increased in a short time to 200. The wild turkeys' habitat is the deep woods and the borders of swamp lands.

They feed on insects, seeds, berries, and other small fruits, and are particularly fond of forest mast.

Briar thickets are especially valuable as a protection against birds of prey and predatory animals. Shallow lakes and ponds are essential to the life of the water birds, and swamps are preserved in their natural state wherever possible. "Don't drain the swamps," has become a slogan for the conservator of wild life, of water birds, and of water animals.

Farmers' assistance.—For the past three years the game division of Maryland has requested the farmers of the State to plant seed of some description and allow it to stand to furnish cover and feed during the winter months. When the weather conditions require



Home of the wild turkey

artificial feeding the farmers have endeavored to locate the game and feed it to carry it through the winter months. The winter of 1926 was a most successful one in this respect. More farmers planted seed and more persons looked after and fed the game during the severe weather, and through the cooperation of the public there was more brood stock left over in the covers on March 15 than in any previous year. There is very little expense attached to this method of conserving wild life, and the farmer who looks after the birds and tries to conserve the brood stock finds their presence very beneficial to his crops. Bobwhite quail is one of our ground-nesting birds which is very beneficial to the farmer, and without these ground-nesting birds the agricultural interests of the State would

suffer severely. What little expense is attached to this method of feeding is repaid tenfold by the benefits derived. In preserving sufficient brood stock each season the division is always assured that under ordinary propagating conditions the wild life will not diminish, even though there is a heavy drain upon it by the hunters.

Nongame Birds

One of the most important factors in the protection of nongame birds in the United States has been the work of the Audubon societies. In educating the general public in the economic value of birds and in creating sentiment in favor of bird protection these organizations have met with remarkable success, and their educa-



Migration of pintails

tional work has paved the way for still more successful efforts in securing the adoption and enforcement of uniform laws and in specific measures for bird protection.

However successful the Audubon societies may have been in their efforts to secure legislation, their practical work of enforcement has been more effective. Through the aid received chiefly by popular subscription protection has been extended to all the important colonies of sea birds breeding along the Atlantic coast from Maine to Chesapeake Bay, on the coasts of North Carolina, Florida, and Louisiana, and in certain points in Oregon. There is no doubt that this work has given the States a great impetus in establishing bird preserves in the State parks of the country.

Plan of Study

A study of the protection of birds in our State parks and of providing suitable habitats for different species should lead directly to some sort of appropriate activity on the part of the children. A bird refuge within the school grounds may be established and pupils in the school appointed as wardens. Bird houses may be built, bird baths and drinking fountains erected, and the refuge supplied with food by committees appointed for that purpose.

In creating a useful bird refuge, the first step is to insure protection against all bird enemies; the second, to see that plenty of nesting sites suited to the needs of various birds are available; and third, to improve food and water supplies, if necessary.

Protection.—The best device is a guard of sheet metal placed on all nesting trees and on poles supporting bird houses. Tree guards



Young robin

should be 6 feet or more above the ground. They consist of either a wide band of metal around the trunk of the tree or an inverted cone of metal attached to the tree at its small upper edge with the lower edge spreading several inches away from the tree trunk. Either of these prevents squirrels or cats from climbing up the trunk and gaining access to the nests in the branches above or to the bird house that is erected on a pole.

Breeding places.—The majority of birds build their nests in trees or shrubs, either in holes or on the limbs or in the crotches. Shrubbery and trees for nesting sites are essential for making a place attractive to birds, and those of the fruit-bearing species should be chosen. Shrubs should be allowed to form thickets and should be pruned back severely when young so as to produce numerous notches. If ground-nesting birds, as bobolinks, meadow larks, and bobwhites are to be protected, grass in the nesting fields must not be cut during the breeding season.

To feed the seed-eating birds a number of commonly cultivated annual plants, belonging to the same groups as those upon which the birds feed extensively in nature, produce good crops of seeds. There are prince's-feather, love lies bleeding, blessed thistle, California poppies, sunflowers, tarweed, forget-me-nots, and sugar cane. Alders and birches bear in their numerous cones a supply of seeds which are eagerly sought for by redpolls, siskins, and goldfinches during the winter. Larches, pines, and other trees of this kind are attractive to crossbills as well as to other seed-eating birds.

Feeding fruit-eating birds is best accomplished by planting selected species of fruit-bearing shrubs and trees. Through late spring and summer there is usually an abundance of insect food in addition to fruit enough for all the birds. So far as fruit alone is concerned, fall is the season of overflowing abundance; in winter the supply gradually decreases, and late winter and early spring are the seasons of actual scarcity. Fortunately there are some fruits that persist through this season. If enough are planted, no birds able to live on this class of food should starve. The best of these long persisting fruits are juniper, bayberry, thorn apples and related fruits, holly and snowberry.

The birds' water supply should be a pool not more than a few inches deep, the bottom sloping gradually upward toward the edge. A giant pottery saucer is an excellent device, or the pool may be made of concrete or even metal if the surface is roughened. A water supply in winter is needed as well as in summer. If running water can not be provided, that supplied should be warmed to delay freezing.

Sanctuaries for Animals

The American bison.—Like the passenger pigeon, the rapid destruction of the American bison seems almost incredible. The primitive number of bisons in this country has been estimated at from 50,000,000 to 60,000,000; in 1850 there were probably remaining 20,000,000; in 1870 only 5,500,000 were left; in 1888, including some in captivity, a meager 1,300; and about 1895 the remnant had dwindled to 800. Since that time the Governments of the United States and Canada, the New York Zoological Society, the American Bison Society, and certain public-spirited individuals have taken steps to conserve and to increase this small herd, until the bison is now breeding rapidly in many parks and private preserves.

The first railroad which crossed the bison's happy homelands on the western plains was largely responsible for their destruction. Access to the herds was made easy, where before transportation had been a problem. The railroad offered an easy means of shipment for

hides and meat. Not the slightest protection was afforded in the way of legislation in these States, and in six years the southern herd was almost exterminated. Another railroad farther north was built, and in seven years the northern herd was destroyed. So general was



The American bison (photo by J. E. Haynes)

the slaughter and the market was so glutted that skins of bull buffaloes brought only \$1; of cows, 60 cents; and of calves, 40 cents.

Shaler insists that the sluggish nature of the bison and in some respects his stupidity were largely responsible for his destruction. Writes Shaler:

Dangerous as he looks, he is a very mild, inoffensive beast, timid and fearful, rarely attacking but in the last hopeless effort at self-defense. His enormous bulk, shaggy mane, vicious eye, and sullen demeanor give him an appearance of ferocity very foreign to his nature.

He was placed wholly at the mercy of his enemies and seemed to be powerless to defend himself.

The beaver.—The beaver is another defenseless animal which has been nearly exterminated by man. This harmless animal was found early in the settlement of this country throughout the length and breadth of North America. To-day it has disappeared from the greater part of its former range, and over much of the remainder



The beaver and its conservation work

it is rare. It is considered the most valuable fur-bearing animal in America and for that reason it has been killed ruthlessly. During the past 20 years an effort has been made to protect it and to allow it to increase unmolested by trap and gun. Already the beaver is becoming abundant in some regions and common in others where it had become extinct. Most of the State parks which have suitable areas are planting colonies of beavers, and wherever this is done they have grown rapidly in numbers and have accommodated themselves easily to changed locations.

Elk and deer.—In the smaller State parks it has been necessary to keep these animals in small inclosures, which has been far from satisfactory. Larger areas should be purchased where they can have

a free range and can live in secluded spots away from the inspection of tourists and the traveling public.

Antelope.—This beautiful animal requires care as well as protection, as it can not forage for itself as well as some of the more hardy animals that find refuge in our parks. Feeding in winter is a necessity and must be done by the warden or his assistants.

Bears.—The winter has no terrors for bruin, for he crawls into a hollow log and sleeps through the cold months of the year. In the State park preserves the bears are playful, comparatively fearless,



Bull elk in the act of calling

and even friendly. They add greatly to the attractive features of any park where they have been introduced.

Mountain sheep.—This animal is another illustration of a species that has been preserved from extinction by the protection given him in our parks. At one time they were hardly seen among the mountains of the West. Now a fine increase in their number is shown, owing to the opportunity offered them in the park preserves of the Rocky Mountains.

The Smaller Animals

The marten.—Any animal that bears a valuable fur on its back is in danger of extinction. The marten or sable fur is one of the

choicest and most expensive of those in use for fashionable attire. For this reason the marten has been so persistently hunted that they are extremely rare. Those that survive are shy and inaccessible. Their refuges in the parks are in the dense forests of pine and spruce which clothe the upper slopes of the higher mountain ranges in the West. The marten is an expert climber and quite at home in the leafy treetops, where he pursues squirrels and hunts bird's-nests with success. He is said also to secure toads, frogs, lizards, and even



Mule deer buck

fish. His home is sometimes a den underground or beneath rocks, but oftener in the hollow of a tree. He is found enjoying the protection which the park provides in most of the Western States where conditions are favorable to his welfare.

The weasel.—The weasel, or ermine, is hunted for his white fur, which is exceedingly rare and so costly that it became in olden times the special adornment of kings and was known for that reason as royal ermine. Ermine fur is white only in winter when snow is on

the ground, for during the summer months the weasel is clothed in a reddish brown coat above and sulphur white below. Its retreats



Home of the black bear

are beneath stone heaps in dense thickets, under logs and stumps, in hollow trees, and also in burrows, though these are usually those



Home of the mountain sheep

made by other animals that it has driven off or destroyed. Says Audubon:

For all his external attractions this little weasel is fierce and bloodthirsty, possessing an intuitive propensity to destroy every animal and bird within its

reach, some of which, such as the American rabbit, the ruffed grouse, and domestic fowl, are ten times its own size.

This little animal, like the marten, finds a refuge in the parks in the northwestern section of the United States.



The marten

The snowshoe rabbit.—This rabbit, like the weasel, changes his coat twice a year, in the spring and in the autumn. He is called the snowshoe rabbit because the elongated track he makes in the snow looks like a diminutive snowshoe track. He is found in the far



The snowshoe rabbit

North in high mountains. He is valued for his fur and his meat, which are used by the Indians extensively. He has been able to survive in spite of disease, unlimited snaring by the Indians, and the attacks of animal foes, because of the numerous offspring which

he produces every year. He finds a refuge in the parks of our North-western States, where his food supply consists of willows and other shrubs that grow along the banks of the rivers. Here he makes his home in the wilder parts of our animal refuges, eating the tender shoots of the willows and caring for his family.

The woodchuck.—Another animal that finds protection in our parks is the woodchuck or ground squirrel. The real home of the woodchuck is his tunnel or burrow in the ground, which varies in length from 10 to 25 feet and is 2 or 3 feet below the surface. There is a snug little chamber at the end of the main burrow containing a small bed of dry grass and leaves where the little woodchucks stay until they are large enough to go out into the world and dig burrows of their own. The old woodchucks sleep in this chamber during



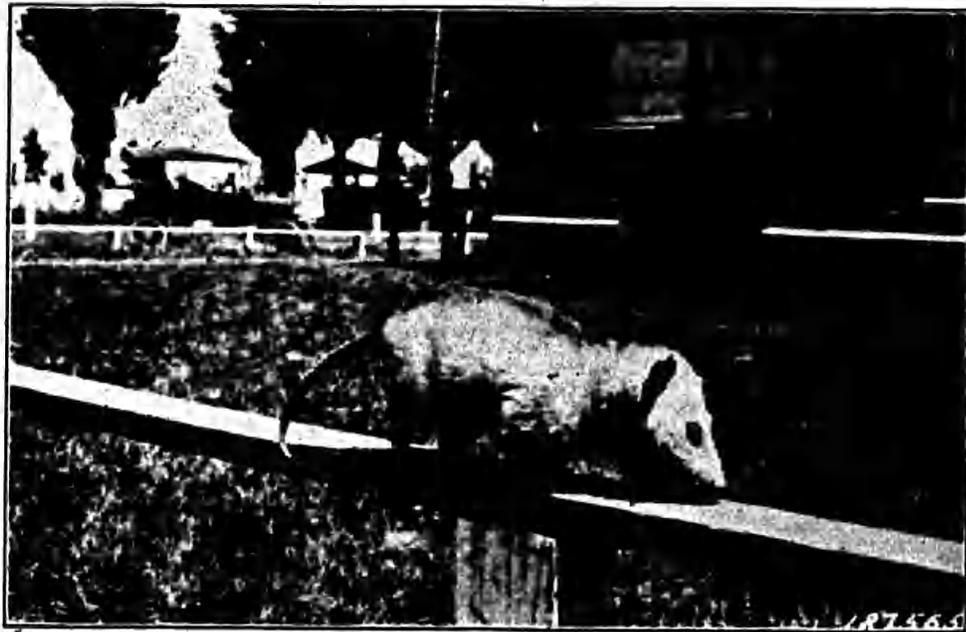
Home of the woodchuck.

the winter, lying with bodies close together, two and two, for warmth during the winter seasons. They eat clover and the tender bark and roots of various kinds and are very fond of garden truck. While the woodchuck in a sense is a cultivator of the soil, yet he often does much damage to the farmer's crops by digging underneath his fields of grain and his plants in the garden, and for that reason he has been slaughtered to such an extent that protection in the park refuges has been offered him.

Opossum.—This small animal is in a class by itself, as it is the only animal in America which carries its young in a pouch. It is native to the South and is considered fine eating by the negro. It has one characteristic which is unusual, in that it feigns death when attacked and will lie for some time in a state of fright which has all the appearance of death. It only comes out at night from its retreat, which is a hollow tree or a crevice in a rock. It is very fond of

young, corn and also eats insects and ground bird's nest eggs. In most of the State forests the opossum is kept more as a pet than as a refugee from the slaughter of men and animals.

Striped chipmunk.—It is the western chipmunk that is pictured here in the hand of the caretaker in one of our northwestern forest animal preserves. This little animal is seldom found in trees, for the open country is more suited to its taste, with trees and berry bushes scattered about and plenty of rock-strewn, sunny spaces between. In these spaces it finds holes among the rocks for its home, or it may make a burrow. Acorns, seeds of pine and of spruce trees and various other seeds furnish its principal food. In autumn it lays up a generous supply of food and when the weather begins to get



The opossum

cold, like its eastern cousin, it takes to winter quarters, curls up and sleeps.

Plan of Study

An effort has been made in these descriptions of animal refuges to describe in detail the native habitat of each animal and its mode of life. It is suggested that the teacher amplify the information here presented and, supplemented by pictures and drawings on the blackboard, create in the child's mind a vivid mental picture not only of the animal itself but of its surroundings; its home, its food, the raising of its young, its enemies, and its need of protection to save it from extinction. No more valuable lessons in nature study could be devised than an intimate study of these animals from the viewpoint of their commercial value and their need of protection.

Special attention is called to the opportunity for lessons on color protection in the case of the snowshoe rabbit and the weasel or ermine; the care of their young in the case of the opossum, and the wonderful ingenuity of the beaver. The relationship between the native characteristics of the animal and his danger of extinction as indicated in the case of the buffalo and the passenger pigeon; the changes which civilization has wrought in the lives of animals and birds; and a study of adaptation to changing conditions, are all



Striped chipmunk

topics which would form interesting subjects for discussion in the socialized recitation.

Wild Flowers

Their beauty.—The picking of wild flowers was a former privilege that one finds hard to give up; yet it should be given up. It is the trees and shrubs and smaller plants, with their wealth of flowers and foliage, that give the wild places the essence of their charm. One finds a paradise. Let him still leave a paradise for those who may come after. The spoliation of the places of natural beauty near our cities through the picking of wild flowers in large quantities by thoughtless children has left the suburban woodlands and ravines

of most of our cities without those assets of beauty and fragrance that the city dweller needs for his refreshment and recreation. Let every thoughtful motorist not only control his own actions in this matter, but let him constitute himself a guardian of the public welfare to advise the thoughtless and restrain the vandal.

Extermination of Wild Flowers in Iowa

Prairie flowers.—A special plea should be made for the prairie flowers. To the naturalist the chief glory in spring was the succession of prairie flowers. Taking Iowa as an example, the pasque flower on gravel knolls, the sweet william, cranesbill, vetch, puccoon,



Lotus beds: Iowa State Park

wood betony, small white lady's-slipper, and Turk's cap lily, and many other spring flowers, once followed in succession by purple cone flower, black-eyed susan, culver's root, pleurisy root, meadow rue, compass plant, aster, goldenrod, and sunflower. The entire season was resplendent with flowers. There are not many of these areas left, but some of them should be set aside for the preservation of these rare plants in all the States where these flowers once flourished.

Rare plants.—The automobile has multiplied many times the danger of extermination of many of our rare plants. Years ago the large pink lady's-slipper or moccasin flower could be gathered by the armful. This magnificent flower grew in damp places, in Iowa by the hundreds, 50 years ago. Forty years ago in one of the peat bogs

there is an abundance of purple fringed orchids, and not a single one is left now. Possibly there may be a few in one of the tamarack swamps, but they have not been found. An orchid has not been seen for 25 years, but the beaked willow is holding on in an isolated bog. Before many years this will be gone.

The beaver.—The beaver no doubt helped to make this bog, and with the disappearance of the beaver the bog began to drain. The moccasin flower, orchids, and ferns have disappeared. The intensive pasturing in Iowa and many other Northern States has caused the disappearance of many plants, like the wake robbin, the large trillium, blue bells, St. Jacobs ladder, the columbine, meadow rue,



Trilliums

and many other plants. What is true of Iowa is also true of many other States.

Other Flowers Needing Protection

Laurel.—One of the plants that need protection is the laurel. Many would think there is absolutely no danger of extermination, but it decreases as you go north until you get into Maine. There is only one locality in Maine where it is found. Florists are responsible for taking large quantities of native material for decorative purposes.

Trailing arbutus is most in danger of destruction. There can be no question that it is abundant in Massachusetts and Maine. Every year a considerable quantity appears on the market, and we must

educate people not to buy it if we are to maintain that plant as one of our native plants. In this family are not only the barberry and the rhododendron, but the azalea as well. For many years we have been wrenching them from their homes and shipping them somewhere else, many hundreds of carloads a year.

The holly is almost destroyed, owing to its use at Christmas time. Substitutes for that are wreaths from oaks and maples that have been treated in such a way that the wreaths will maintain their pliability for 15 years.

State Flowers

The lady's-slipper is a State flower in Minnesota; and where you have a State flower, people are very much in search of it. Please do not pick a State flower; pick rather one of the common ones of which people can pick all they want.

The columbine is the State flower of Colorado and is being rapidly destroyed; and the Toyon, or Christmas berry, in California is in danger of extermination.

Replanting

It would seem proper for the State park interpreter, who finds rhododendron, or goldenrod, or redbud, or sand myrtle, or wild lilies, or orchids, or magnolias, or whatever seems to give a rare and characteristic note to the scenery, to increase their masses in size and sumptuousness and to combine them with other plants after the suggestions of the locality. Thus may he be said to improve on nature, for he is doing not just what nature did, but what she hinted; not just in nature's way but as she might have done in a somewhat different frame of mind.

Protection

Many laws have been suggested as a means for preventing the destruction of a native plant. Maryland law provides that no one shall enter upon the land of another and pick flowers or take away any of the trees without written permission of the owner, subject to a fine of \$25 and imprisonment. Some States are offering part of the fine to anyone who complains.

An active campaign for the protection of dogwood has been made through a local daily paper in Washington, D. C. For two weeks an article appeared in each issue. Pictures of the flower were posted with the legend: "Please leave the dogwood to be enjoyed." One of the specialists in the Department of Agriculture says of this campaign:

On the first Sunday that the dogwood was out I personally covered about 125 miles in an afternoon to see what effect the campaign was having. I

would not attempt to say how many automobiles I passed—several hundred of them. In only two of them were any dogwood branches, and they were very small ones. Only one car line leading into the dogwood region did not carry the posters, and this car line was the only one reported to me where people brought dogwood bushes into the car. A similar campaign is planned in the fall on holly and ground pine. I believe that through educational methods people can be brought to the selection of good artificial substitutes for the purposes of Christmas decorations.

Plan of Study

Perhaps the most practical application of these lessons on wild flowers will be for the children to put on a campaign for the protection of some particular flower that is in danger of extermination in their vicinity. Posters may be prepared and efforts made to placard business places, automobiles, and street cars. Children will become actively interested in protecting the flowers during this campaign, and this interest can be easily revived when other occasions arise. The moral effect of a band of earnest children bent upon a mission of this kind reaches into the hearts of the people and into the homes of the entire community. A public sentiment can thus be roused that will do more than all other means toward protecting the wild flowers of our country from extermination.

A fernery.—Every schoolroom, if possible, should have a fernery. This can be made out of an old aquarium or a glass globe. Take the class for a field lesson in the woods and let them dig up several specimens of plants which will thrive well in a fernery. Place a layer of pebbles in the bottom of the dish and then over that a layer of earth from the woods, about 3 inches deep. Plant any of the small varieties of ferns and flowering plants, like arbutus, dogtooth violets, hepaticas, and wild orchids. Keep the earth moist and the dish covered with a piece of glass so the plants will not be affected by the dry air of the schoolroom. If a trip to the woods is not feasible, wild flower plants and ferns may be bought of a florist.

Sanctuaries for Fish

Fish in our running streams and in our inland lakes need protection quite as much as animals, birds, or wild flowers. Fishing is a universal sport and probably more enjoyed than any other form of outdoor recreation. So accessible to the sportsman and so inexpensive in necessary equipment is this form of amusement that great slaughter of fish annually occurs along our waterways.

Fish commissions.—Every State has a fish commission which attempts to regulate the catching of fish in all waters within the State. Restrictive laws are quite as stringent and fines and penalties

quite as severe as are those to protect other game. Planting fish in the waters of the State is also one of the duties of the commission. The supervision of fish wardens and the distribution of licenses with the disposition of fees are also part of their work.

In California in the years from 1922 to 1924 the fish and game commission planted more than 56,500,000 trout and 35,500,000 salmon in the streams of the State. These were reared in the State hatch-



This picture shows five ways in which a goldfish is fitted for living in the water.

1. The goldfish is shaped like a boat so it can go through the water easily.

2. The goldfish has fins to swim with.

3. The goldfish has no eyelids. We have eyelids to keep our eyes moist but the goldfish does not need them for he lives in the water.

4. The goldfish have gills to breathe with.

5. The goldfish has scales. They make them slippery so they can slip through the water easily.

Written lesson on goldfish, fourth grade

eries, of which there are 16, the same number which the State of Michigan supports.

Fishing in State Parks

One of the foremost attractions offered by the State park is the opportunity for fishing. The State fish and game commission, cooperating with the State park authorities in many States, provides opportunities whereby tourists and camping parties may indulge in this sport and may add a tempting bit of fish food to their daily bill of fare.

Plan of Study

A detailed study of the work of the fish commission in the State would be of great value to pupils as illustrating the work of one of the most important agencies in the country that seeks to conserve our food supply. If possible a visit to a fish hatchery should be made, where the children can see the different stages of development from the eggs to the young fish that are ready to be planted in the streams and rivers and inland lakes of the State. A study of the fish itself in its relation to its environment is suggested by the following example of a fourth-grade pupil's written reproduction of a study of gold fish.

An Aquarium

Every schoolroom should have an aquarium. These may be made with a glass globe bought at the fish store or may be made by the children of pieces of glass set in a frame and held in place with putty. The fish can be purchased at a fish store, if gold fish are desired, or they may be caught in nets in neighboring streams by the pupils if the common specimens will be satisfactory. These fish, however, will not long survive in a school aquarium. The food will need to be purchased from the dealer, and only small amounts should be fed to the fish at one time. If the school is located at a distance from the dealer, the fish can be sent safely by express to any address desired. To watch the habits of the fish, and to feed them and care for them, is one of the best lessons that the children can learn in nature study.

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Chapter III

CONSERVATION OF FORESTS

Lessons in Nature Study

The State park and forest is not only a sanctuary for the wild life of the forest, but the conservation of the forest itself is of prime importance to every member of the State community. The State forest is probably the greatest natural asset which the country possesses. It supplies us with nearly every necessity and luxury which we use in our daily lives.

*Use of wood.*¹—The farmer is the greatest user of wood in the United States. He needs it for repairs and improvements, for fences and buildings, and for fuel. There are 1,000,000 cubic feet of timber used in fence posts every year, of which the farmer uses the largest number. The railroads use 125,000,000 wooden crossties annually in their roadbed construction, which means a cut over of forest land amounting to 1,250,000 acres. A big Sunday daily newspaper uses 20 acres of pulp wood for a single issue and for the week's edition a Chicago daily uses 40 acres. If it takes 2,000 acres of wood pulp to print one daily for a year, what must it cost in acreage to print all the newspapers in all the cities and towns of the United States? Add to this the books we read and the annual distribution of magazines, and we have some idea of the amount of timber that is used for paper alone. Yet this amount is only 5 per cent of the entire cut of lumber in the United States in a year. The insignificant lead pencil requires 7,300,000 cubic feet of cedar for a year's output of 315,000,000 pencils.

About 15 per cent, or one-seventh, of all the lumber cut in this country goes into the making of boxes and crates.² These boxes must be made strong and durable, as the railroads paid over \$1,000,000 for damages to goods in one year on account of faulty containers. Then there is the "small dimension" stock which consists of handles, spokes, chairs, furniture, toys, and agricultural implements, together with the automobile parts and the airplane construction, all of which

¹ Hough, Emerson, "The slaughter of the trees." *Everybody's Magazine*. Vol. XVIII.

² Greeley, W. B., Forest Service, United States Department of Agriculture, Yearbook, 1920.

amount to nearly 46,000,000 cubic feet of standing timber in a year. Our new dwellings each year which are needed to house the people of America, our fuel wood, distillation wood, mine timbers, poles, cooperage, shingles, and veneer logs all take a heavy toll from our forests.

The Slaughter of the Trees

Nearly half of the land area of the United States, some 822,000,000 acres, was originally in forests, and nearly half of this virgin forest is gone. The ax, the insect, the fungus, and fire are largely responsible for this slaughter of the trees. Growing trees are not only



Desolated area

valuable in themselves, but they form a protective covering for the soil: The roots of the trees hold the soil in place, and when the trees are gone there is nothing to prevent the light vegetable soil from being carried away by the currents of surface water. After a time nothing is left on the hillsides but clay and rock; deep gullies are formed, so that the slopes finally become utterly worthless. On the other hand, if the run-off of the rainfall is checked by the trees, more of the water finds its way into the ground and flows out in springs. This prevents floods and regulates the stream flow.*

Lumbering.—A system of "timber mining" has stripped the land of its trees and has left it bare and desolate. We are cutting down

* Dana, Samuel T., Forester, U. S. Department of Agriculture, Yearbook, 1920.

four trees in our forests for every tree we plant. The "inexhaustible" forests of Michigan "mined" during the eighties and nineties are now so depleted that the State buys every year over a billion board feet of lumber and pays on it an annual freight bill of \$15,000,000.

The careless lumberman is one of the worst enemies of the forests. He can use only the larger trees and in felling them and getting out the logs he breaks down and kills the young growth. With a little



Treatment of decaying trees: Digging out the decayed wood, the fungus, and the insects

care this might be saved to become a second growth of timber. Not only is the timber destroyed by this method, but the land becomes barren and good for nothing.

Fungus growth.—Fungus is a kind of tree cancer and is as dangerous to trees as cancer is to people. The only cure is to cut out all the infected parts and cover the wound with tar and creosote. In the first picture the tree doctor is digging out the fungus growth

which has eaten into the heart of the tree. In the second picture he has covered the opening with tar paper. Then he has taken a syringe and is forcing a liquid spray into the cavity which will kill the fungus germs and all the insects that are living in the tree. In the third picture the cavity has been filled with cement so that nothing in the air can reach the heart of the tree.



Cavity closed with tar paper and fumigated

The insect.—The insect pest working day and night throughout the year kills \$130,000,000 worth of trees annually. The western pine beetle alone has killed during the past 10 years more than 1,500,000,000 board feet of our best trees, with a stumpage value of more than \$3,000,000. Some of these insects attack the leaves, others bore into the bark and sapwood. Even if the tree is not killed, it is so weakened that it falls an easy prey to decay.*

*"Timber, Mine or Crop," U. S. Department of Agriculture, Yearbook, 1922.

No period of the tree's life is free from these attacks; and every part, from the smallest roots to the terminal buds, leaves, flowers, and fruit, may be infested by one or many species of insects. The bark beetles girdle the trees; the caterpillars eat the leaves and buds; pruner beetles eat off the new tips; gnats and lice produce galls; scale insects suck the juice; weevils kill young trees; mole crickets gnaw the roots, and after the tree is dead the sawyer beetle spoils



Cavity filled with cement and treatment completed

the wood. The most important check to insect destruction of trees are the birds. For a detailed study of the relation of the bird and insect to the tree, see *Cycles of Garden Life and Plant Life*, United States Bureau of Education Bulletin, 1925, No. 15.

Forest Fires

The lookout.—This observation tower is on Harney Peak in Custer State Park, in the Bad Lands of South Dakota. It is 7,340 feet

high and overlooks the Harney fire district. The lookout's wife is standing on the rocks near the tower house and is searching through her glasses for signs of forest fires.

Below her she sees a patchwork of hills and valleys and dark green forest trees. Here and there are settlers' cabins and cleared spaces where crops are growing. The road runs like a yellow ribbon through the valley, and the waters of a stream almost hidden in the depths of a canyon sparkle in the sunlight. Far away an express



Moths laying eggs

train is winding through a pass in the mountain, leaving a thin trail of smoke dissolving in the air.

The room in the tower house is rimmed around with windows, so that the lookout and his wife can see a fire in any direction. A large map of the district is spread out on the table, and the fire finder swings on a pivot over the map. The ranger sights the fire outside his windows through the finder and then phones down to the fire ranger in the valley below.

The forest ranger.—Just as soon as the lookout locates the fire he calls up the ranger at his station in the forest. Everything here is ready for a quick start. The ranger gets out his horses from the

stables and loads his pack horses with a folding rake and shovel, a mattock, and a good axe. He packs his bedding and cooking outfit and two or three days' supply of "grub" in panniers or saddlebags on the horse's back. He mounts his own horse, and in 30 or 40 minutes from the time he gets his call he is on his way to the fire.



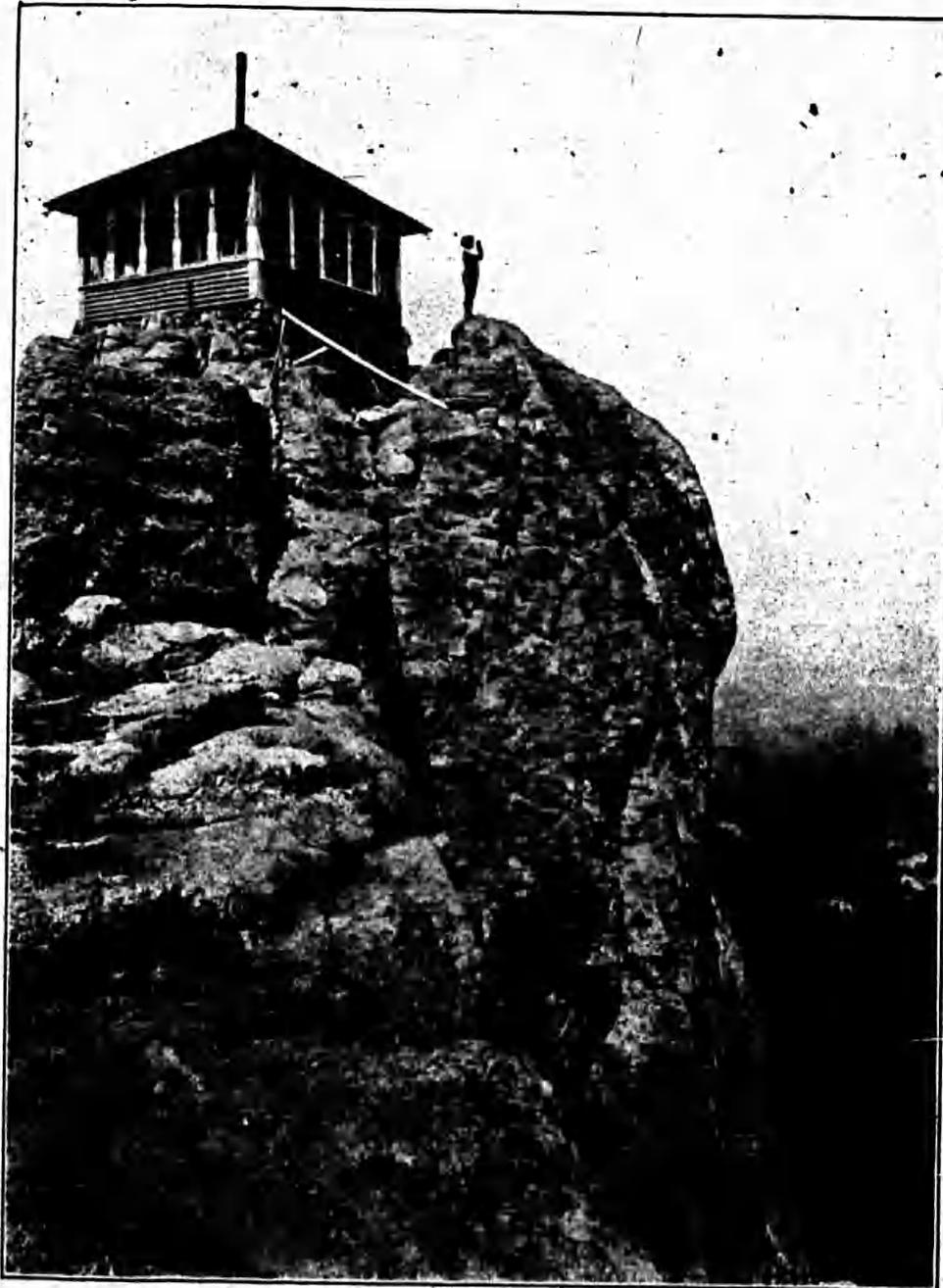
Tree and insects

If the fire is in the grass and burning slowly, the ranger tries to beat it out. He throws a blanket over the handle of his shovel and works along the margin of the fire, beating down the flames which are spreading farther and farther into the timber.

Sometimes, if the fire can not be stopped in this way, he digs a broad furrow along the edge of the fire. The freshly turned earth

is one of the best barriers for a fire of this kind. The grass burns until it reaches the furrow and then it stops.

When the fire is a large one and a whole forest is burning, the supervisor and all the men that can get away come to help out the ranger. A long pack train of supplies is brought in. Camp is made.



Harnty Peak observation tower, South-Dakota

A field telephone is set up and the men live in the forest for days and sometimes for weeks, fighting the fire.

When a heavy growth of timber is threatened with fire the men clear a space by back firing. They cut a path along the edge of the timber by clearing out all the undergrowth and raking away the

leaves and grass. Then along the edge of this path farthest away from the timber they make a firebreak. That is, they burn every living thing down to the ground with torches they carry in their hands. All the bushes and weeds and undergrowth for the space of several feet are completely destroyed. When the forest fire reaches this burned area it has nothing to feed upon and it gradually dies down and goes out.

Causes of forest fires.—Lightning causes one-third of all the forest fires in the United States. When a tree is struck by lightning it bursts into flames and the fire spreads quickly. These fires are difficult to reach, for they are apt to be hidden away in the heart of the forest, and roads have to be cut through before the men can get



Inside of tower room

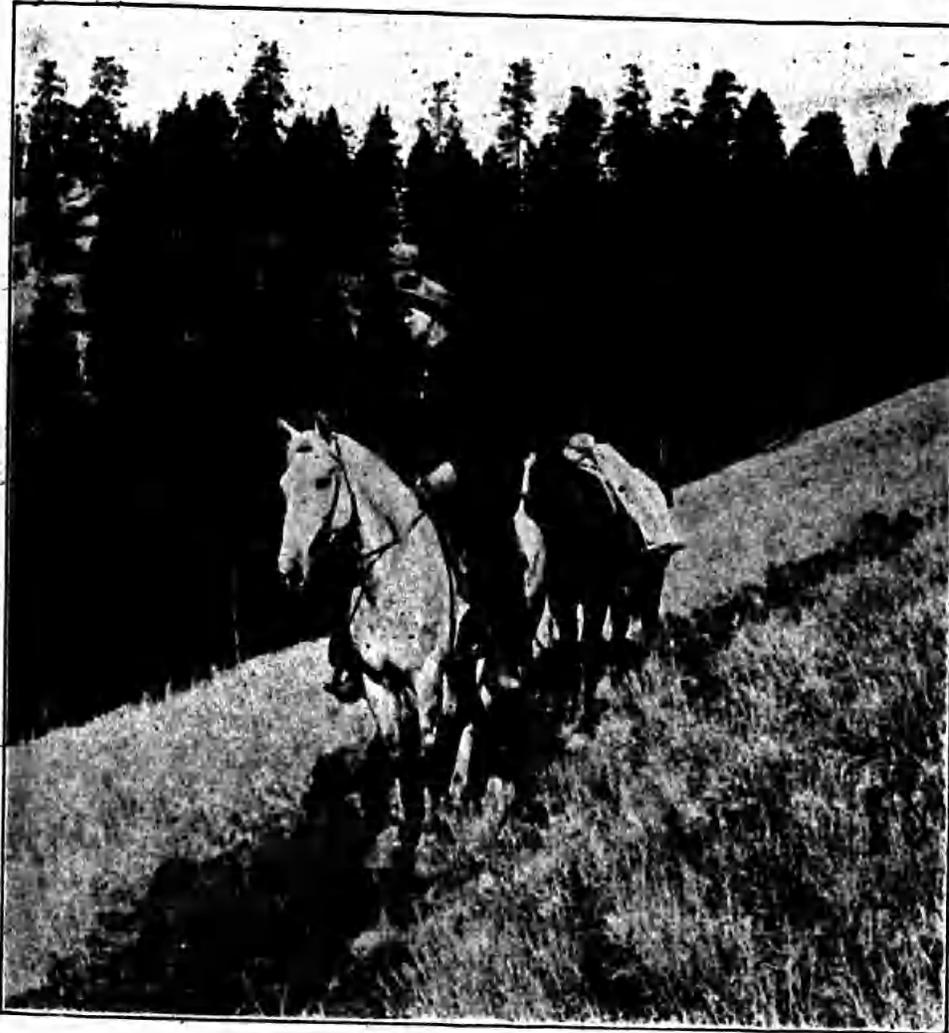
to them. In the meantime the fire has gained great headway and is difficult to cope with. The observation towers and lookout stations which are being built all through the State parks are of great service in locating these fires quickly and the improved tools now in use make road building much easier, so that the damage done by lightning in the forest has been greatly lessened.

Railroads have caused more forest fires in many States than any other agency. The dry grass and bushes that are left along the tracks make excellent fuel when a live coal or a flying spark falls from the engine. In recent years the railroad companies have tried to keep the right of way along their lines of travel free from this inflammable material, and guards around the fire boxes, with spark

arresters in front of the engine, have cut down these fires to a small number. The oil burning engine which is used on many lines does away with this menace entirely.

Careless campers are the cause of a large number of forest fires. The following seven tested rules for preventing forest fires, if carefully observed, would prevent the fires that are set by this group of park visitors.

1. *Care.*—Be as careful with fire in the woods as you are with fire in your home.



Forest ranger on a trip of inspection

2. *Matches.*—Be sure your match is out. Put it in your pocket or break it in two before throwing it away. Make this a habit.

3. *Tobacco.*—Throw pipe ashes and cigar or cigarette stubs in the dust of the road, and stamp or pinch out the fire before leaving them. Do not throw them into brush, leaves, or needles.

4. *Location of camp.*—Select a spot as free as possible from inflammable material, sheltered from the wind, and near accessible water.

5. *Camp fires.*—Never build a camp fire against a tree or log, in leaf mold, or in rotten wood. Build all fires away from overhanging branches and on a dirt



Trying to beat out a fire with a blanket



Freshly turned furrow



Pack train taking supplies to the fire fighters

or rock foundation. Dig out all rotten wood or leaf mold from the fire pit, and scrape away all inflammable material within a radius of 3 to 5 feet. Make sure the fire can not spread on or under the ground or up the moss or bark of a tree while you are in camp, and that it is going to be easy to put out when you are ready to leave.

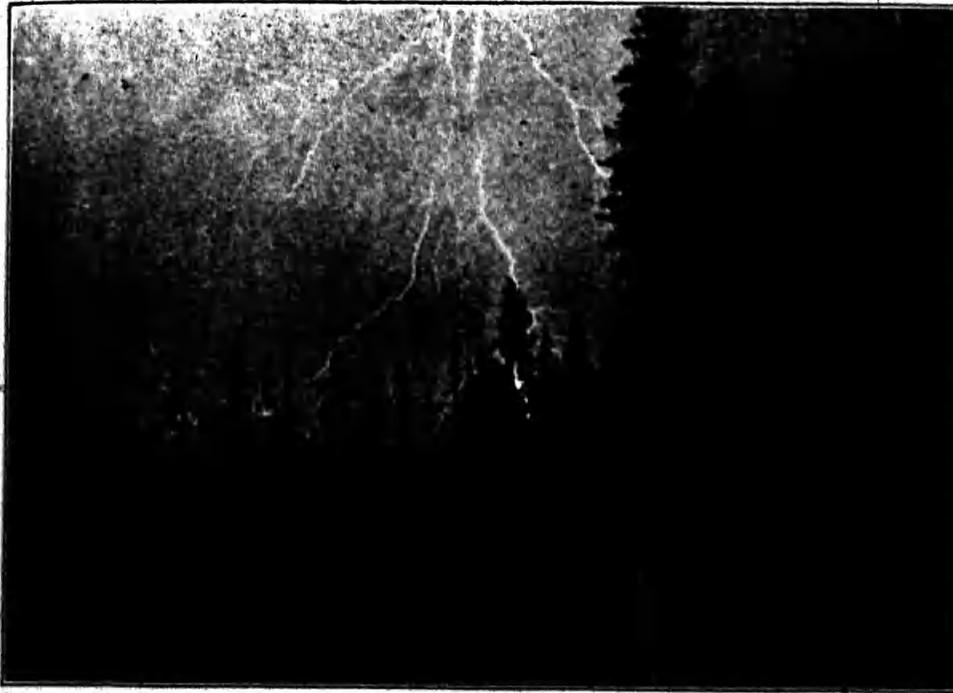
6. *Leaving camp.*—Never leave a camp fire, even for a short time, without completely extinguishing every spark with water or fresh dirt free from moss



Back firing

and leaf mold. Do not throw charred logs to one side, where a smoldering spark might catch. It is well to soak thoroughly all embers and charred pieces of wood and then cover them with dirt. Feel around the outer edge of the fire pit to make sure no fire is smoldering in charred roots or leaf mold. Hundreds of fires escape each year after campers have thought they were extinguished.

7. *Put the fire out.*—If you discover a forest fire, put it out. If you need help, notify the nearest forest fire warden. A telephone central will connect you with him.



Lightning striking a tree



Camp fire properly covered

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Fishermen, berry pickers, smokers, hunters, those persons who are clearing land of brush and undergrowth are all responsible in some measure for the annual loss of 29,000,000 acres of trees in the United States forests, worth in money over \$100,000,000.

Reforestation

There are 81,000,000 acres of forest land in the United States which are largely barren. The timber has been stripped from the land, and it has been left without cultivation either for forests or for agriculture. No region or State can afford to let forest land remain idle if a profitable use can be found for it.

Deserted lumber villages are scattered all over the United States which might have been kept alive if some use had been made of the



Burned-over area where seed has been sown

denuded forest land in their vicinity. After the timber is cut by some short-lived shifting industry, the mill and factory move on to denude another forest area. The railway system which was built for timber traffic stops its service, pulls up its rails and ties, and follows the mill. This leaves the mill hand without work, and the whole life of the community suffers. Everyone who can get away leaves, and those who stay on sink into poverty and wretchedness. No longer are taxes coming in to pay public expenses. The schools are closed, the church is without a pastor, and the market dwindles to just the bare necessities. Anyone who has ever seen a deserted village will appreciate what timber mining does to such a community.

In both the State park and the State forest the preservation of trees is of first importance. Sometimes seeds are scattered over burnt areas, but most of the renewing of forests is done by setting

out young trees which have been grown in nurseries. In most States the conservation commission supplies the seedlings, and they are set out under the supervision of the State forester. In the six New England States and New York and Pennsylvania over 99,000,000 trees have been planted on State land up to the close of 1925.

Arbor Day

Boys and girls are helping to make up this waste of trees by planting as many as possible on arbor day. More than a million trees were planted in Nebraska on the first arbor day, April 10, 1872, and since that time the ceremony has spread to every locality in the United States. Programs are usually given which include many of the following subjects: The meaning of arbor day; its



Same area nine years after

origin; its spread and observance; dates of observance; arbor day and the spirit of civic betterment; care of trees; planting of trees along roads and highways; the effect of trees on water supply; memorial trees; trees to plant; planting suggestions.

Plan of Study

Perhaps the most practical method of presenting the subject of forestry to classes of pupils is by ~~the~~ demonstration and practice. Pupils should collect forest tree seeds and plant them in boxes in the schoolroom. A field lesson for this purpose will be enjoyed by the class and will be a valuable lesson in nature study as well. If a visit to a forest is not practicable, the seeds may be gathered under trees along the street or highway. Peach baskets are good receptacles for the seeds, and it is well to have each pupil carry his

own and do his own collecting. In this way the tree and its environment are impressed on the pupil's mind.

After the seeds are gathered and brought into the schoolroom, they should be mounted and labeled. Large sheets of drawing paper are suitable for this, as they are easily handled. The seeds are arranged on the paper in an attractive manner and are held in place by pasting narrow strips of writing paper over them. The classification of the dissemination of seeds into seeds that fly, fall, sail, or stick may be used, although the latter method does not apply to forest trees. The seeds of the pines and maples sail, of the cottonwoods and poplars fly, and of the oaks and nut trees fall. Enough



Tree nurseries

seeds of each variety should be gathered so that there will be some left to sprout in the schoolroom. These will be valuable material for lessons on germination and similar subjects in nature study classes.

The pupils should follow up this work of seed study by planting large tracts of land with forest trees as is done in several schools in different States, especially in New York. Usually the town board secures the land and turns it over to the district superintendent for a school forest. Sometimes the planting is done as an arbor-day exercise. One school began work at 9 o'clock in the morning and planted 10,000 trees by noon. The older boys were organized into grub-hoe gangs who made the holes for the trees. Each teacher

took charge of 6 or 10 girls, who worked in groups of two. They had a 10-quart galvanized iron pail with as many trees in it/as could be carried conveniently. Each girl took a row of holes, and the pail was kept between the two. They were carefully taught to place the roots well down in the hole and to place the young tree close to one side of the hole. Then the pile of dirt left by the grub hoe was pressed firmly around the roots. The old sod was placed around the tree with the roots up and served as a mulch in drought. After a little practice, 60 girls could plant several thousand trees in a few hours. Only about 15 per cent of the number of trees planted failed to grow. The marker for this planting was made of two heavy



Tree planting

planks, 2 inches by 8 inches and 16 feet long, placed on edge 6 feet apart and held in place by other planks placed on top of them and at right angles to them and all strongly braced. A two-horse team was hitched to the marker and it was dragged along the ground to mark the rows across the field.

One boy in a country school in New York began planting trees when he entered high school and now has 67 acres of young forests. He has placed an order with the conservation commission for 10,000 Scotch pines, 10,000 white pines, and 500 Norway spruces to be planted this spring. He says:

I have planted a few thousand trees each year since I started high school a few years ago. As soon as I finished school and college the first money I earned went into a 75-acre plot which I wished to set out completely. It now

contains 25,000 Scotch and white pines which are thriving. One field of a little over an acre set out in the fall of 1921 contains 1,500 white pines, of which only 8 died this year. Some of my older trees grow between 30 inches and 3 feet in diameter each year. Those set out in 1915 are now 16 feet high, and 4 inches in diameter at the butt. To date, I have 67,000 trees.

State Forest Rules in Pennsylvania

1. The State forests are for the use and benefit of all the citizens of Pennsylvania. Forest officers are instructed to cooperate with, and assist all persons in the legitimate enjoyment of them.

2. To provide for the proper use and protection of the forests, no standing young or old trees shall be cut, shot at, barked, or otherwise damaged or destroyed except as may be necessary for proper utilization of the forests and with the approval of a forest officer, secured in advance.

3. Since uncontrolled grazing by horses, sheep, cattle, or hogs is injurious to young trees, it is prohibited except by special permission.

4. No permit is required to camp overnight, but to insure the protection of forests against abuse a permit is necessary to camp for a period of two days or longer.

5. For the protection of the public health, springs and streams must not be polluted.

6. If the needs of the State for timber are to be met, forest fires must be stopped. No camp fires are permitted which are not adequately protected against the spread of fire.

7. All camp fires must be put out completely, immediately after use.

8. Persons suspected of starting forest fires, intentionally or unintentionally, will be prosecuted.

9. The placing of advertisements is not permitted.

10. For the protection of those who will camp in the forests hereafter, all waste paper, empty cans, and other refuse must be buried or otherwise disposed of before leaving camp.

11. For the protection of wild life, strict observance of the game and fish laws by campers will be required.

12. For the preservation of flowers, the gathering of flowers of woody species is prohibited, except on permission of a forest officer.

Chapter IV

LESSONS IN GEOGRAPHY

Adirondack Park in New York

One of the largest reservations of forest land in the United States is the Adirondack Park, in the northeastern part of the State of New York. This reservation is slightly larger than the State of Connecticut and comprises an area of more than 3,000,000 acres, covering a territory of 12 counties. Within its borders are found the highest mountains in the State, great areas of rolling country, numberless lakes and ponds, a network of streams and rivers, vast tracts of true primeval forests, as well as lumbered regions and regions cleared for agriculture.

This park not only affords a wealth of scenery unsurpassed in wildness and beauty, but at the same time it is easy to reach by train or motor. One can leave any part of New York State and within 12 hours can launch his canoe in one of the lakes or streams which extend throughout the reservation. Railroads entirely surround it, and one line crosses through the very heart of the region. Highways and dirt roads lead to all parts of the mountains, and no fewer than 10 foot trails climb to the summit of Mount Marcey, where the entire top of the State is spread out to view. These forest preserves have been acquired for the protection of the headwaters of streams, for the preservation of forests, and for a playground for the millions of people who can enjoy it for camping, hunting, fishing, and recreation.

Contour.—The mountain belt, whose greatest width is about 40 miles, runs from Lake Champlain in a southwesterly direction and is a wild region of rugged mountains showing in its formation the oldest rock in the world. Five separate mountain chains or ranges run parallel with each other through the entire belt, about 8 miles apart. An interesting contrast can be made between the rounded domes of these mountains and the sharp peaks of the Rockies which are found in Custer Park in the Black Hills of South Dakota. The Adirondacks are an old formation, worn smooth by centuries of erosion. The Rockies are much newer and their peaks not yet old enough to have been worn down to the rounded forms of the more ancient ranges.

The lake region of the Adirondack Park stretches westward from the base of the main Adirondack range to the borders of the forest, a distance of 50 miles. Within this water area are all sizes of lakes and ponds, some that permit the navigation of large steamers, others too small for even a canoe. These bodies of water are so closely connected that trips of 100 miles can be made in canoes, broken only by short "carries" that seldom exceed 2 miles in length. These water routes, together with mountain trips and good highways, combine to make this region a mecca for summer tourists. Nowhere in the world may be found such a combination of wild, grand scenery, and delightful, easy travel, lying at the very threshold of dense population.



Mount Marcey, Adirondack Park

History.—More than 40 years ago the people of the State of New York decided not to sell any more land in this section of the State and passed a law providing that this region "shall be forever kept as wild forest land for the use of the public." Early in the nineteenth century, in the year 1820, Gov. De Witt Clinton urged the legislature to conserve the Adirondack Forest in order to maintain a water supply for the Erie Canal, which was just then being opened.

The State forest idea dates back to the Revolution, when New York owned practically all the territory north of the Mohawk Valley. After the Revolutionary War was over, all the land in the State belonging to England or to the Tories was taken over by the State by what is known as "forfeiture of grants made by the British

Crown, either to the State itself or to the Tories, whose estates were confiscated."

Plan of Study

A comparison here between the rounded tops of the Adirondacks and the sharp jagged peaks of Custer Park in the Black Hills of South Dakota, Chapter V, will bring the idea of erosion home to the children. Many pictures of mountains should be presented in these lessons. Those of recent origin compared with older formations will lead the children to read at a glance something of the earth's history, and to appreciate the fact that the great forces of nature are forever building up and tearing down, are forever reconstructing the contour of the earth's surface.



Points au Sable State Parks in Michigan

Points Au Sable State Parks in Michigan

Along the eastern shore of Lake Michigan the sand dunes are shifting and moving as they have been doing for one hundred times a thousand years. They have formed small inland lakes along the coast which offer most attractive summer resorts for colonies of cottagers. A long peninsula of sandy ridges piled up by the wind through countless ages separates the great Lake Michigan from the smaller lake behind it, and offers quiet, secluded waters to summer tenants, for swimming, sailing, canoeing, and fishing. It offers a quiet harbor as well for the Great Lakes steamers, where they can be safely docked, unloaded of their cargo, and loaded again.

Two such sites as these have been selected for the new State parks of Michigan. One is in Mason County, on Grande Point Sable, and the other in Oceana County, on Little Point Sable. One of Michigan's most spectacular dunes is contained in the Oceana County site. Here is a broad stretch of sand of mountainous proportions moving slowly but steadily eastward into Silver Lake. Each year the wind, with the waves of great Lake Michigan, moves up tons of fresh sand, pours it on green forest trees, and releases others that have been buried for years.

In the Mason County site there is a different type of lesson. Here, too, is an inland lake, Hamlin, to the east of the park, with great Lake Michigan in the west. But the dune here is permanent, and about 240 acres is covered with a splendid stand of white and Norway pine. People in Michigan acquainted with the lands are now looking forward to the day when they can be used as parks, for swimming, picnicking, camping, and hiking through the sands.

The Dunes State Park in Indiana

This park is located on the shore of Lake Michigan, in the northern part of Indiana. It covers 2,000 acres and extends for a distance of 3 miles along the coast. The peculiar formation of the park is found nowhere else in the world save in this vicinity. The sand dunes have a scenic beauty all their own. There are dense woodlands and high and bare bluffs of wind-torn sand, with deep, quiet hollows filled with many kinds of wild life of plants and animals, birds, and insects.

The park lies only 50 miles from Chicago and is in direct line of travel from east to west across the continent. Eleven trunk lines of railroads pass it, and 12,000,000 people reside within reach of it by the purchase of a dollar ticket. A huge pier for the use of steamers is to be built and adequate bathhouses and shelters for visitors. It affords opportunity for all types of sports for both winter and summer and for land and water. The botanist finds every variety of plant life here; the historian finds traces of early Indian life; and the artist can find all phases of nature in lowland or highland, beach or marine, in any season of the year, expressed in the greatest beauty.

Study of erosion by wind and water.—The wooded dunes are permanent, but the bare sandy ones are being built up or torn down by the relentless winds which sweep in over the water. One may watch the making of a dune as it begins to form in a tiny mound on the beach. A brisk wind blowing over the beach and carrying a load of sand meets some obstacle like a tuft of grass or a piece of driftwood. Here a little sand is dropped, and a tiny dune is formed.

More and more sand is added until the small mound becomes after many years a great one, sometimes rising to a height of 300 feet. But the wind not only builds up dunes but it tears them down as well. Even an old dune can not protect itself against this force.



Tamarack swamp—Dunes, Indiana

The wind takes up sand not only from the beach but from the surface of the dune. It is gathered up from the windward side, and carried up over the crest only to be dropped on the leeward slope. So the dune may be shifted, inch by inch, from windward to leeward. In time, the old dune is swept away, and a new one rises beyond it.

Dunes move in this way farther and farther inland from the water, changing the shore line of the lake and widening the beach. Dunes cease to move and become fixed when enough vegetation covers them to protect them. Even a wooded dune is not safe from the wind. If the sand piles up against the trees faster than the trees can grow, they become buried under the sand and smothered. Then the freakish wind may uncover them again and one sees a graveyard of dead trees standing, stark and bare, where there was once a green and living forest.

History.—The Indian history of this region centers around Pontiac, the Indian chief who ruled over the territory around the head of Lake Michigan. The shore of this lake at this particular point was a paradise to the tribes of Indians who fished in the lake waters from their canoes or hunted through the forests. Traces may still be seen in the park of old camping grounds and Indian trails along the bluffs leading from one village to another.

Recently a group of Chicagoans have established a summer camp in the Indiana park, and arrangements have been made for all the children in the orphanages of the State to take their summer outings there. A strip in the rear, called the hinterland, is to be devoted to social service, in which the State or perhaps the American Red Cross may assume charge.

Plan of Study

An excellent description of dune study by a class of third-grade children¹ is found in the Francis W. Parker School Yearbook on Science. A pupil's report of a trip to the dunes is included here as an excellent illustration of the value of this material for nature study lessons and the opportunity it gives for written reproduction, as well as the intriguing interest it possesses for the children.

OUR TRIP TO THE DUNES

We went to Millers, Ind., Friday, October 9. We met at the school at 7.40 that morning, and went down to the La Salle Street station. It took us about an hour on the train to reach Millers.

On the way we saw some swamps and great quantities of tumbleweed. The leaves were turning red, and brown, and gold. Many trees were still green, and many of them were pine trees.

We climbed some dunes and found a place to put our wraps. We then started out to see what the country was like. We climbed a high dune and saw the deep blue water of the lake, swamps, and sand dunes everywhere.

We found wild grapes, colored leaves, and many different kinds of bone. Helen found a turtle's egg on the edge of the swamp. It was white, and about 1½ inches long. It was oblong in shape. Some of the boys saw a snake.

After lunch we started to fish. We wanted to get some things for our aquarium. Many of us had nets and the director had a dredge to use in the

¹ These pupils have had unusual training in this type of study lessons. Ordinarily dune study should be placed in fifth-grade classes.

swamps. We caught crayfish, tadpoles, frogs, leeches, newts, rockfish, and minnows. We found the larvæ of the dragon fly. We think the dragon fly goes through three stages, just as the butterfly does. We are going to keep it through the winter and see if it will change. One of the tadpoles was a bull-frog pollywog. The other, we think, will change to a green frog with gold buttons. We caught two kinds of snails. One was an oval oblong and the other a flat coil. We caught whirligigs, water boatmen, larvæ of the May fly, and water beetles. We also found four kinds of water weeds. There was some wild rice in the swamp. Along the edge of the swamp we found gentians, the bottle gentian and the fringed gentian. Along the road we found prickly pear, and witch-hazel. The witch-hazel had its flower and fruit on at the same time.

We started home at 3.15, and had a very good time that day.

Cumberland State Park in Kentucky

This park is located on Pine Mountain, just north of Cumberland Gap, where the boundary lines of three States—Virginia, Kentucky, and Tennessee—come together. It covers 4,000 acres of land in one of the most picturesque spots in America. The mountains stretch away in every direction, with gentle slopes heavily wooded or high abrupt ridges bordering the valleys which lie between. Here the mountain streams begin their westward journey toward the Ohio River, cutting their way through the mountain passes and forming the mountain gaps which have made this section of our country of great historic interest. On Pine Mountain the scenery is wild and rugged. Massive beds of sandstone jut out at high angles, sometimes rising 200 feet in the air. The softer rock beneath these blocks of sandstone has been worn away by the weather, leaving shallow caves which are known as rock houses.

A study of mountain folding.—Shaler in his survey of Kentucky pronounces this mountain one of the most beautiful illustrations of the action of mountain building forces in the world. 'Some force within the earth has pushed up the underlying sandstone so that it has broken through the surface and formed the high ridge which we call Pine Mountain.' This ridge has been slowly rising for centuries and twice has been worn down by the action of those forces of nature which we call weathering. How very slowly the mountains in this range have risen is shown by the streams which cut across it and seem to flow uphill from a lower level on the eastern side of the range to a higher level on the west. But while the mountains are higher in the west, the river beds are lower here because the streams have been able to cut down by erosion faster than the land has risen. If the time shall ever come when the uplift shall become much more rapid than at present, the flow of the streams westward will be

¹Ashley and Glenn, United States Geological Survey; Shaler, Kentucky Geological Survey; Mary Verhoeff, Kentucky River Navigation.

obstructed. In this event their courses will be turned about and will set in toward the east where they will join the rivers of the Atlantic slope rather than those of the Ohio Valley as they do now.

History.—Cumberland Park has great historic interest from the fact that Cumberland Gap lies at its southern boundary and that visitors to the park will pass through that historic roadway. Cum-



Rock formation

berland Gap is a notch in the mountains about 500 feet deep and in some places so narrow that there is hardly room for a roadway. Daniel Boone discovered this passageway through the mountains in 1769, while he was hunting in the forests on Cumberland Mountain. His home was in Virginia, and he had supposed that there was no way across the mountains at this point that would lead into the

Ohio Valley. When he came through the gap at the western end, on the track of a deer he was hunting, he was amazed at the beauty of the country which spread out before him and which is now known as the State of Kentucky. Groups of Virginia settlers began to find their way over the pass as soon as Boone returned home and told his people of the wonderful valley he had discovered on the far side of the mountain. Six years later he and his companions blazed a trail through the gap, which has since been known as the Wilderness Road and which played an important part in the Civil War.



Boone's Memorial

An endless procession of emigrants began their journey over the pass. Men, women, and children, horses, cattle, and household goods, the covered wagon and the pack horse took their way from the eastern seaboard in Virginia to the fertile plains of Kentucky. A memorial has been erected to Boone's memory at the head of the gap by the Daughters of the American Revolution. And now the Dixie Highway runs its concrete track over this route where the backwoodsman blazed his trail, and 700 tourists pass over it daily on their journey north or south through this great thoroughfare which extends 2,200 miles from Sault Ste. Marie in Michigan to Miami, Fla. Midway the journey stands Cumberland Park, to welcome the travelers and to offer rest and recreation to those who desire it.

Plan of Study

This park offers an unusual opportunity to teachers for giving the children a few elementary lessons in geology. The structure of this mountain system Shaler calls "a mountain of simple folds." Each pupil may represent this by a crumpled fold of paper in this wise: Grasp a sheet of paper at its outside edges and bring the hands together, crumpling the paper between them. When the sheet has been released and laid on the desk it will present a good illustration of a mountain range with parallel ridges and valleys like those in the Appalachian system. The children may cut gorges across the folds to show how the streams have worn their way down through the rocks while the mountains have been slowly rising. Further development of this project will lead the pupils to lay out a series of highways through the valleys, to select the suitable sites for cities and towns, and to suggest where waterfalls and lakes are most likely to be found in sections of like topography.

It is said that Cumberland Gap has played a more important part in the settlement of this country than any other geographical feature of historical importance in the United States. This idea will open up a most interesting line of investigation by the pupils regarding the effect of topography upon the development of a people; the type of pioneer in this section of the country; where he came from and what were his characteristics; what effect has mountain life on a people; what effect has open valley life; how do these people of the same stock differ, those who passed through the gap and settled in the Ohio Valley and those who remained in the mountains. Roosevelt's "Winning of the West" should be read in this connection, and Charles Egbert Craddock's "Great Smoky Mountain," either in parts by the teacher to the class or by the pupil, preferably the former.

Petit Jean State Park in Arkansas

Almost in the center of the State of Arkansas, in the southern part of the Ozarks, is the Petit Jean Mountain, and on its flat top the Petit Jean State Park of 80 acres is situated. The mountain is shaped like a flatiron, with the tip toward the east. It is 1,100 feet high, and is the oldest mountain in the world, for the Ozarks are the remnant of a once mighty range which existed in this country in its earliest days and which has been worn down by countless ages of erosion.

It is a most beautiful site for a park, surrounded by high bluffs sloping gently toward the center, where the Cedar River, fed by springs and smaller streams, cuts its way through a series of gorges to the western end of the mountain. Here it plunges over an embank-

ment 100 feet into a wide canyon which winds down the mountain side and through which the river has worn a channel to the depth of 300 feet. Great rocks have fallen from overhanging cliffs, from time to time, along the course of the river, both above and below the falls, which add greatly to the rugged beauty of the scenery. On the mountain large fields of these boulders stand in the midst of a primitive



Cedar Falls, Arkansas

forest of giant pines. They rise in the air 100 feet, and on their peaks above the highest tree tops one may look off over the rolling hills and narrow valleys for 50 miles in every direction. The park includes the falls and the rapids above and below the falls. There are several branching canyons of similar beauty which have lately been included in the State property.

A study of erosion by running water.—The history of the erosion which the rocks and gorges in this park reveal is similar to that of Niagara Falls. The harder sandstone lies on top of a softer shale which wears away and undermines the harder; upper layers of the sandstone. When the erosion cuts under the sandstone so that its support is gone, it topples over and breaks away from the cliff where it has rested from the time of its formation. Sometimes the upper sandstone remains in place and the erosion underneath cuts out a cave or a rock house as it is called.

These rock houses are one of the peculiar features of the Petit Jean Park. One of these is so large that 100 people can find shelter in it. That it must have been used as a dwelling by early races of people is shown by the pictures which cover the walls and which by their great age, seem to link, so the historians tell us, the people of that time with the people of ancient Egypt.

There are no forces in nature that work so silently and irresistibly and with so certain a result as the forces called erosion. Freezing and thawing are among the most effective of these. They break up the soil and loosen it, they enter every tiny fissure in the rocks and widen them, so that running water can more easily wash away the looser material after it has been worked upon by the frost and the sunshine.

Plan of Study

Field trips are needed to impress any lesson of erosion on the minds of the pupils, and fortunately such lessons are always near at hand. At every door step of every school in the country some evidences of erosion may be seen. If possible a camera should be used during these lessons, and pupils should make blueprints of the section studied, showing how the erosion is taking place. These studies offer the most valuable type of material for oral and written language lessons.

Reelfoot Lake Park in Tennessee

This park is situated near the Mississippi River, in the north-western part of the State, in Lake County, Tenn. The park includes Reelfoot Lake, which is about 10 miles long and 5 miles wide, and certain portions of the ground surrounding it. For 15 years the lake has been a State refuge for birds and fish, and rules regarding fishing and hunting on the lake have been made to protect the wild life which is found there in great abundance. It is a sportsman's paradise, for it lies in the path of migration which our water birds take in their journeys north and south during our spring and autumn seasons. The first cold snap in the fall brings flock after flock of at least 20 varieties of ducks down from the north, and they settle in the marshes of Reelfoot for a few days of rest and feeding. The

mallards are most numerous, but there are pintails, redheads, black duck, and teal, with many of their less popular cousins of inferior varieties. After the ducks are gone the coots cover the open portions of the lake until the water is black with them. The double-breasted cormorants come here to fish and form their long curving lines on the water. They beat up the surface with their feet and wings and so disturb the poor little fish that they rise to the top and are caught in the long bills that are waiting to capture them. The lover of bird life will find over 250 different varieties for study here, some of them very rare and not to be found in other spots in the United States. As the lake stands on the borderland between the



Reelfoot Lake, Tennessee

North and the South, many southern birds come as far north as Reelfoot for their breeding grounds, or like the wood ibis of Louisiana visit the lake after their breeding season is over.

But the wonders of Reelfoot are the cypress trees which grow in the swamps about it, and the American lotus blossom, called the chinquapin lily, which floats above its waters. Shaler predicted, some 50 years ago when he visited the lake, that the cypress "is destined to become one of the most important of our American soft woods," and for these reasons: "It attains great size, is remarkably free from blemishes, and can be worked with ease." He says regarding it: "As our pine forests diminish, these cypress swamps will

yield a larger and larger part of the soft wood of the country." Of the chinquapin he speaks in glowing terms:

No other American flower approaches it in gorgeous beauty. The corolla, a great yellow, lily-like cup, often a foot across the rim, is borne on a stem 3 feet above the water; on either side two leaf stems lift into the air leaves which are over 2 feet in diameter; the other leaves float in the water around these elevated stems.

History.—The history of Reelfoot Lake is like that of no other body of water in the world. Over a hundred years ago, in the year 1811, the lake was suddenly formed by an earthquake. The land where the lake now stands began to sink as soon as the earthquake was felt and dropped from 10 to 20 feet in a few hours. Immediately the water flowed in over the sunken land, forming what has since been known as Reelfoot Lake. A large forest of cypress trees growing on this land was lowered with it, and roots and trunks were covered over with the water. There they stood for many years, their roots in the lake bottom and their tops, some of them more than 100 feet above the lake, slowly dropping to decay. At last a fire from the shore swept over them leaving wide stretches of charred and blackened tree trunks standing in the water.

Cypress knees.—No tree seems to be able to live with its roots under the water. When air is shut away from the roots the tree smothers. As the cypress tree loves to grow in swamps and marshy places, its roots are often below the water. When this happens and the water is not too deep, the tree sends up a root stem which grows until it reaches the surface. Here a knob is formed on the end of the stem called a knee and the tree is supposed to breathe through it. Other trees besides the cypress have been known to grow knees on their roots when they have been covered with water.

A study of earthquakes.—The New Madrid earthquake which formed Reelfoot Lake is noted because it is the only earthquake which has ever visited a river valley far removed from volcanoes. It has become one of the wonders of the world. No earthquake had ever been known in the region before. People were awakened in the night by the groaning, creaking, and cracking of the timbers of the houses or cabins in which they were sleeping, by the rattle of furniture thrown down, and by the crash of falling chimneys. The ground rose and fell, says a writer of that time, as earth waves swept over it, like long low swells of the sea, tilting the trees and opening the soil in deep cracks. On the Mississippi great waves were created which sank many boats and washed others high up on the shore.

An Indian village was sunk beneath the water at this time and all the people in the village were drowned. The Indians thought the earthquake was sent as a punishment to the old chief's son, Reelfoot,

because he stole his bride from another tribe who lived farther south, down the Mississippi River.

The cause of earthquakes.—When we think of all the different materials which are underneath the ground, we wonder that the regions below us remain as quiet and as peaceful as they appear to do. There are the streams of hot water in some localities which come to the surface as geysers. There are oil pockets out of which the oil comes gushing, sometimes at the rate of 1,600 barrels per day. There are the vast reservoirs of natural gas which have been tapped and have, in some instances, supplied cities with light and heat for many years. Streams of cold water flow under the surface nearly



Cypress knees exposed by receding water

everywhere, to be tapped by wells or to issue from the hillsides as springs. Veins of coal, and veins containing iron, copper, gold, or other metals occur in many places and are reached by mines. But layers of rocks of many different kinds compose the greater portion of the earth's crust.

All these are apparently nicely balanced and maintain what we call their "equilibrium." When anything happens to disturb this equilibrium, then a new arrangement of the materials must take place; rock masses may shrink or expand, or one rock mass may slip over another. Too great a strain is created in one spot and something gives way under it. Then there must be a new adjustment of the rocks, and the gases, the waters, and the oils; or whatever is in that part of the earth's crust. Sometimes this is done quietly under-

neath the ground, and sometimes it comes to the surface in the form of volcanic action or an earthquake. Vents and wide cracks are frequently formed, out of which the lava, ash, and sand may gush as they are driven into the air. Many "sand blows" occurred during the New Madrid earthquake, filling the air with a sickening vapor and causing complete darkness.

Plan of Study

The study of this park opens up a series of lessons that will be of intense interest to the children. It suggests a series of projects on earthquakes and on swamp life, the fish, the birds, the trees, and flowers which abound there. A detailed study of the cypress tree would be most appropriate in this connection. If possible, secure the *Geographic Magazine* for January, 1924, for a detailed account of the lake and the Indian legend of Reeffoot. Write to the Bureau of Forestry, Department of Agriculture, Washington, D. C., for data on the cypress and an account of their late experiments with the knees of this peculiar tree. A set of 50 slides giving pictures of the cypress and a lecture on forest botany can be secured from them which will give the children an interesting and enjoyable entertainment.

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Chapter V

LESSONS IN HISTORY

TREES

I think that I shall never see
A poem lovely as a tree,
A tree whose hungry mouth is pressed
Close to the earth's sweet flowing breast,
A tree who looks at God all day
And lifts her leafy arms to pray.
A tree who may in summer wear
A nest of robins in her hair,
Upon whose bosom snow has lain,
Who intimately lives with rain.
Poems are made by fools like me,
But only God can make a tree.

—Joyce Kilmer.

Many of our State parks and forests are named in memory of the men who have contributed to the development of the State's resources or who have given exceptional service to the Nation's growth and prosperity. It is indeed fitting that sections of land within a State set aside for recreation and conservation purposes should become at the same time memorials for the great men of our country.

Joyce Kilmer State Forest Monument

A poet and soldier.—Pennsylvania has remembered many of her distinguished sons by naming for them her State parks, her forests, public camps, and State forest monuments. The Joyce Kilmer Public Camp in the mountains of Pennsylvania where he spent his boyhood has been named for the American boy poet who made the supreme sacrifice during the World War and immortalized his name by his unexcelled poem on "Trees."

"Gypsies are Welcome Here" has been placed over the entrance to this camp in memory of the poet's often expressed wish that some spot might be set aside where gypsies might be welcome. A placard giving "Trees" in full is also at the entrance to the trail which leads to his monument.

Geography.—This camp of 23 acres is a forest of old hemlocks and white pines, accessible only by foot-trail, on the north slope and summit of Paddy Mountain. The Joyce Kilmer trail leads to the mountain top above and to the natural amphitheater known as Joyce Kilmer Rest. Here a group of flat bowlders form a semicircle surrounded and overhung by gigantic, dark hemlocks. The camp is



Joyce Kilmer

located 5 miles east of Woodward, in Union County, on one of the State highways.

Custer State Park

An Indian fighter.—Custer Park, in the Black Hills of South Dakota, is one of the largest and finest State parks in the United States. It is named for the famous Indian fighter, General Custer, whose campaigns against the Indians covered a large part of this territory.

Geography.—This peak is a tract of land 8 miles wide and 12 miles long and covers an area of 107,440 acres. Besides Harney's Peak, 7,254 feet in height, it includes several other summits over 6,000 feet high, notably Lookout Mountain and Buckhorn Mountain. It is a wonderland of scenic beauty with its lakes and gorges, its canyons and valleys threaded by clear streams teeming with trout and covered from the edge of the prairie with a heavy growth of western yellow pine. The park starts at the foot of the Rocky Mountain Range and goes up gradually for about 4,000 feet to the summit. The new Needles Highway from Sylvan Lake through the picturesque granite needles section is one of the most remarkable scenic roads in the country. It climbs to over 6,000 feet above sea level, skirting precipitous pinnacles of granite or tunneling its way through the solid rock. Custer State Park offers a natural and convenient stopping place for tourists bound west from the Mississippi and Missouri points to the Yellowstone or Rocky Mountain National Parks.

Franklin K. Lane Memorial Grove

A statesman.—The Franklin K. Lane Memorial Grove, in the Humboldt State Redwood Park in California, commemorates the service which Mr. Lane rendered his State and country and is dedicated with these words:

WELL-BELOVED SON OF CALIFORNIA. CREATIVE STATESMAN IN A DEMOCRACY. THIS PIECE OF THE FOREST PRIMEVAL IS FOREVER DEDICATED IN AFFECTION AND REVERENCE.

Geography.—The Franklin K. Lane Memorial Grove is about 200 miles north of San Francisco, on the Redwood Highway, one of the great scenic routes of the country. This grove of redwoods is one of many tracts that make up the Humboldt State Park in northern California. The redwood forests, of which the grove is a part, are unique and are to be found nowhere else in the world. Many of these trees are over a thousand years old and are the tallest living trees on earth to-day, in some instances reaching a height of 350 feet, with a diameter of 30 feet.

Akin to the redwoods and yet not quite identical are the Bigtrees of California. As many as 4,000 annual rings have been counted by John Muir, the scientist, on the stump of one of these Bigtrees, showing that it had been growing on the Pacific coast for more than 600 years when King Tut-ankh-amen began to reign over the destinies of the Egyptian people about 3,000 years ago.

Longfellow-Evangeline State Park

The story of an exile.—Evangeline's history, made famous by Longfellow's "Tale of Acadie," is commemorated by a newly created State park in Louisiana, on the banks of the Bayou Teche (pronounced Bayoo Tesh). This park is called the Longfellow



Redwoods, California

Evangeline State Park and marks the spot where Eyangeline, deported from Acadia by the English, met her lost lover, Gabriel St. Martinsville, about 100 miles west of New Orleans, is the Acadian town where Evangeline lived, and here on the banks of the Teche is the spreading live oak where Evangeline and her people landed, and near by are the Evangeline home, church, and other landmarks.

The Acadians were exiled from Nova Scotia in 1755. Herded in old ships, families and friends torn asunder, some landed in Maryland and some in Louisiana, many of them to become wanderers searching for one another through the desolate wilderness. After three years the Maryland group worked south to the settlement at St. Martinsville, and the lost were finally reunited.

Geography.—Bayou Teche is a small tidewater channel in the southern part of Louisiana, west of Grand Lake, flowing south and emptying into Atchafalaya Bay. It was once the outlet or the main channel by which the Red River discharged its waters into the Gulf of Mexico. The land through which the Bayou Teche flows has been formed from the sediment brought down by the rivers



Bayou Teche, Louisiana

and by the overflows. The Teche is navigable to St. Martinsville, about 100 miles above the bay.

The Evangeline country has become one of the most popular points of interest to the tourist in the South, and the gift of 150 acres of land to the State as an Evangeline memorial will insure its preservation for all time to come.

Revolutionary War Memorials

Historical memorials of the Revolutionary War have been created in every State concerned in that great conflict. Many of these commemorate the campaigns of Washington and his generals during that period.

The Israel Putnam State Park in Connecticut

A great general.—The Israel Putnam Memorial Camp in Connecticut was the scene of the camp of General Putnam's division of Washington's Army during the winter of 1778-79. The remains of many of the old firebacks built by the continental soldiers at the time of this encampment are preserved. The park contains a colonial museum in a stone building designed for that purpose, a memorial monument, a pavilion, and other buildings for the use of tourists who may desire to camp there. It was established in 1887, the first of the 44 State parks which Connecticut now owns and controls. Two blockhouses, one on either side of the gateway, guard the entrance to the park and stand as reminders of the old colonial days when forts were built to protect the colonists from the Indians.

The Wolf Den, made famous in the Story of Putnam and the Wolf, has been purchased by the Daughters of the American Revolution and is to be preserved as another memorial to the famous general.

Geography.—The Israel Putnam Memorial Camp Ground comprises 203 acres, including a lake of 16 acres. It is southeast of Danbury about 4 miles and is reached by one of the State highways. It has been allowed to remain in its natural state as much as possible and possesses many elements of scenic beauty.

The Wolf Den, where Putnam captured the wolf, is a tract of land of 80 acres lying in the northeastern part of the State, in Windham County. It is well cared for and open to the public.

Washington Crossing State Park in New Jersey

Commander in Chief of the War of the Revolution.—Washington Crossing State Park, in New Jersey, is a historical memorial to mark the spot where Washington crossed the Delaware River and landed his troops at Trenton on the night of December 25, 1776, turning the tide of America's defeats into a glorious victory.

Geography.—This park is 6 miles above Trenton and comprises 237 acres. The old historic Ferry House is still standing and is used as a historic shrine and museum. The park extends along the Delaware River and is covered with a fine growth of mature trees. A State forest nursery is to be installed in this park for growing tree seedlings for use throughout the State and 60 or 80 acres of forest plantations will be installed, showing a wide variety of species being planted out for forestry purposes.

Lewis and Clark State Park in Washington

Two great explorers.—Lewis and Clark State Park in Washington is named for the noted explorers who early in the eighteenth century

blazed a trail through the western wilderness and scaled the pass over the Rocky Mountains to reach the Oregon territory, which now comprises the three great States of Oregon, Idaho, and Washington. The romantic story of the Bird Woman, Sakajawea, who guided the expedition, should be noted at this time. With her baby strapped to her back she led the party for long weeks and months through the forests, from her home in North Dakota on the banks of the Missouri to the home of her people at the foot of the Rocky Mountains. Here the men of her tribe, through her influence, took up the journey and showed the expedition where they might safely cross over the mountains.

Geography.—The Lewis and Clark State Park is located about an equal distance between Seattle, Wash., and Portland, Oreg. It embraces an area of 520 acres of virgin timber, largely of splendid Douglas fir. The park is crossed by the Pacific Highway and makes a convenient stopping place for tourists on their journey along the Pacific coast.

Plan of Study

The children during this study will be especially interested in the memorials within their own State, although many of these names possess a national significance as well. Pupils will be eager to inquire further into the lives of the men who have become worthy of these honors.

Many lessons in character building may be taught in connection with these lessons in history. What did these men do to win the regard of their countrymen? What were some of the characteristics they possessed which helped them to succeed in their undertakings? These are pertinent questions which will lead the pupils to a better understanding of the motives and purposes which inspired our great men to become strong and virile in character.

Correlated subjects, especially in literature, will enhance the lessons and add much of interest to the story of *Paddy* given in this connection. Joyce Kilmer's poem, *Trees*, will be doubly appreciated after the children become familiar with his haunts on Paddy Mountain. Another poem of his which has become a great favorite is *The House with Nobody in It*. A Joyce Kilmer Day might be instituted and a special program worked out, with reports of his life, his love of nature, his literary attainments, and his high-hearted valor.

Longfellow's poem of *Evangeline* may become a vivid picture of pioneer life in this country if presented during a study of the State park in Louisiana. Washington's desperate straits during the winter of 1778-79 will hold a new significance when the memorial at Washington's Crossing becomes a vivid reality to the children. Some of

the hardships of Custer's valiant campaigns against the Indians will be better understood after the children have taken an imaginary journey through the canyons of Custer Park and have climbed the Needles Highway to the summit and have stood at an elevation of 6,000 feet, looking out over the Black Hills of South Dakota.

Events in colonial history become real and vital when the children picture the ancient landmarks in the Israel Putnam Park in Connecticut. They see the Continental soldiers cooking food at the old firebacks or warming their frosted feet before the camp fires, and all the deprivations and the misery of that heroic army come vividly before them, and the principles for which this heroic band so bravely lived and so bravely died are indelibly stamped upon their memories. Franklin K. Lane's efforts to help to make happy the lives of those associated with him will be remembered by the children as long as the Redwoods are growing in the Humboldt forests because of the dedication of this memorial grove to his memory.

The opening of the great Northwest and its place among the States of our Union will be recalled again and again as the Lewis and Clark State Park in Washington is studied by the children, and the men whose names it bears will seem more real and their service to our country become more and more appreciated.

LIST OF STATE PARKS AND FORESTS¹

ALABAMA.—*Historical sites.*—Horseshoe Bend, site of victory of Andrew Jackson over Upper Creek Indians, 1814; Port Toulouse, site of Indian town of Taskigi, post of French 1714, British 1765, American 1814; Montpellier, burial place of David Tate, made military post by Andrew Jackson; William Weatherford burial place; Fort Confederation, site of French Fort Tombecbee, 1745; Twenty-seven Mile Bluff, grave of Henri Touff, early French settler; homestead of Sam Mauack; Pole Cat Springs, a celebrated camp meeting place.

ARIZONA.—None.

ARKANSAS.—Petit Jean State Park.

CALIFORNIA.—California State Redwood Park, Humboldt State Redwood Park, Inyo National Monument, Diablo, Burney Falls, General Bidwell.

COLORADO.—None.

CONNECTICUT.—Sherwood Island, Hurl Park, Mount Tom, Mount Bushnell, Seldon Neck, Haystack, Ivy Mountain, Mohawk Mountain, Great Hill, West Peak, Mashamoquet Brook, Saptree Run, Macedonia Brook, Bolton Notch, Dart Island, Wharton Brook, Buttonball Brook, Kent Falls, Hammonasset Beach, Black Pond, Devil's Hopyard, Lake Waramaug, Wooster Mountain, Nathaniel Lyon Memorial, Humaston Brook, Campbell Falls, Quinebaug Pines, Mount Carmel, Wolf Den, Minnie Island, Fort Shantok, Squantz, Meshomasic, Nipmuck, Union, Shusbury, Housatonic, Natchaug, Mohawk, Tunxis, People's Forest. *Public monuments.*—Monument to Maj. John Mason, who overthrew the Pequot Indians in 1637; monument to Israel Putnam, senior major general of American armies in Revolution; shaft marking grave of Nathan Hale, patriot; Nathaniel Lyon Monument, Mexican and Civil War soldier, killed at Wilson's Creek, 1861. Tri Mountain; Black Rock; Cockaponset; Nepang; Nehantic; Poolatuck; Naugatuck.

DELAWARE.—None.

FLORIDA.—Royal Palm State Park, Dade Memorial State Park, Natural Bridge, Port St. Joe, Olustee State Park.

GEORGIA.—None.

IDAHO.—Heyburn State Park, on Chatcolet Lake and St. Joe River, at the south end of the larger Coeur d'Alene Lake, in the northwestern part of the State; Priest Lake State Forest.

ILLINOIS.—Cook County Forest Preserve; Starved Rock Park; Fort Chartres, named for the Duke de Chartres, son of the regent of France; Fort Massac, built in 1757 by the French, captured in 1765 by the British, and taken by the Americans under George Rogers Clark in 1778; Lincoln Monument and Lincoln Memorial Hall, Old Salem Park where Lincoln kept store, practiced surveying, became a captain in the Black Hawk War, studied law and was elected to the legislature; Vandavia Courthouse, occupied from 1830 as the courthouse of Fayette County; Douglas Monument Park, Chicago, where Stephen A. Douglas was buried; the Lincoln Homestead, a plain two-story house of two rooms;

¹ Report on State Parks and Forests: The National Conference on State Parks. Washington, D. C.

Metamora Courthouse, where Abraham Lincoln practiced law, built in 1845; Fort Creve Coeur, called "Creve Coeur" (broken heart) because of serious difficulties La Salle was under at the time; Dixon Blockhouse, where Lincoln served as a soldier in the Black Hawk War, on the Lincoln Highway; Shabbona Park, occupied by a monument built by the State (Shabbona, for whom it is named, was a Pottowatamie chief who tried to warn the settlers of Black Hawk's intention to slay them); Cahokia Mounds, largest prehistoric, artificial earthwork in the United States, and other smaller mounds; Garrison Hill Cemetery, resting place of pioneers of old village of Kaskaskia, a 20-acre tract bought by the State in 1891 after the original burial ground was washed away; Lovejoy Monument, to Elijah Parsons Lovejoy, forerunner of emancipation, built by the State in Alton Cemetery in 1897 at a cost of \$30,000.

INDIANA.—Turkey Run; McCormick's Canyon; Clifty Falls; the Lanier Homestead; Muscatatuck; Dunes of Lake Michigan, at Tremont, about 50 miles from Chicago; Clark County State Forest; Lake James; Steuben County.

IOWA.—Backbone, Bellevue, Theo. F. Clark, Clear Lake, Devil's Lake, Doliver Memorial, Eagle Lake, Eldora Pine Creek, Farmington, Fort Defiance, Gitchie Manitowish, Fort Atkinson, Oak Grove, Lacey-Keosauqua, Ledges, Ledy, Lewis and Clark, Lost Island, Medlum Lake, Merrick Park, Morehead Caves, Oakland Mills, Orleans Park, Pullsades, Pilot Knob, Elbert, Rice Lake, Rush Lake, Silver Lake (three in different counties), Okamanpedan (Tuttle) Lake and Park, Wall Lake, Twin Lakes and Park, Wapsipulcon, Flunders-Bixby, Little Wall Lake.

KANSAS.—John Brown Memorial Park at Osawatomic, of 20 acres (the John Brown Memorial Park is the site of the fight, on August 30, 1856, when Capt. John Brown's force of 40 men was overcome by 400 "border ruffians," or pro-slavery men); Pawnee Rock State Park, at Pawnee Rock; Fort Hays State Park, at Hays; Scott; Mead County; Neosho County; Pittsburg.

KENTUCKY.—Cumberland State Park (this is on Pine Mountain, near Pineville, just north of Cumberland Gap); Kentucky Natural Bridge State Park (this is a great rock arch, on the dividing ridge between the two counties in the Red River Valley in eastern Kentucky); Fort Harrod Hill, site of the first settlement in Kentucky by John Rogers Clark; Blue and Gray State Park; Kentenia.

LOUISIANA.—Longfellow Memorial, on Bayou Teche, 100 miles north of New Orleans, where Evangeline, deported from Acadia, met her lost lover, Gabriel.
State game preserves.—The Rockefeller Preserve; the Russell Sage Preserve, covering Marsh Island, on the Gulf of Mexico; the State Wild Life Refuge; Rainey Refuge, donated to the National Association of Audubon Societies by Mrs. Grace Rogers as a memorial to her brother, Paul Rainey; Rapides.

MAINE.—*State game refuges.*—Katahdin Park Game Preserve, Rangeley Game Preserve, Deer Isle. *Old forts.*—Fort Machias; Fort Knox; Fort St. Georges; Fort Edgecomb; Fort Popham; Fort Baldwin; Fort McClary, formerly Fort William, named for the famous Sir William Pepperell; the Sugar Loaf Islands.

MARYLAND.—The six State-owned forests are: Four in Garrett County—Skipnish, Brier Ridge, Herrington Manor, Kindness; one at Fort Frederick, east of Big Pool on the Potomac River; the other just west of Baltimore on the Patapsco River and Swallow Falls-Muddy Creek Falls. Fort Frederick is one of the best preserved forts of pre-Revolutionary days. It is in the form of a square 240 feet on a side with corner bastions, with walls 20 feet high. It was built in 1756 by the Colonial governor, Horatio Sharpe, on the then frontier.

MASSACHUSETTS.—Oakham Forest; October Mountain; Otis; Peru; Peter-
sham; Pittsfield; Sandisfield; Shawnee; Shutesbury; Spencer; Suffield; Temple-
ton; Tolland-Granville; Warwick; Wendell; Westminster; Windsor; Worth-
ington; Arthur Warton Swann; Harold Parker; Myles Standish; Otter River;
Savoy Mountain; Ashburnham; Bash Bish; Blandford; Beartown; Clarksburg;
Colrain; Conway; Erving; Hawley; Hubbardston; Leominster; Mohawk Trail;
Monroe; Mount Grace; Northfield. *State reservations.*—Mount Greylock Reser-
vation; Wachusett Mountain Reservation; Mount Everett State Reservation;
Deer Hill Reservation; Mount Tom State Reservation; Purgatory Chasm;
Mount Sugar Loaf State Reservation; Goodwill Park; Mount Ann Park; Rocky
Narrows; Governor Hutchinson's Field; Monument Mountain Reservation; Pine
Knoll; Petticott Hill; Parsons Reservation; Carlisle Pines Reservation; Gillson
Hill Reservation; Torrey.

MICHIGAN.—D. H. Day; Youngs; Harrisville; Wm. Mitchell; East Tawas;
Gladwin; F. W. Fletcher; Dunes; Burt Lake; Grand Haven; Otsego Lake;
Island Lake, Dodge Bros. No. 1; P. H. Hoefft; Marquette; Dodge Bros. No. 3;
Dodge Bros. No. 5; Dodge Bros. No. 7; Dodge Bros. No. 9; Bloomer No. 1;
Bloomer No. 3; Magnus; Baraga; Bay City; Huron; Van Buren; Higgins Lake;
John Walker Wells; Traverse City; Presque Isle; Grand Traverse; Oauway;
Cheboygan; Interlochen; Bungle; Wilson; Charles Mears; White Cloud; Cedar
Hills; Orchard Beach; Hanson; Aloha; Muskegon; Dodge Bros. No. 2; Dodge
Bros. No. 4; Dodge Bros. No. 6; Dodge Bros. No. 8; Dodge Bros. No. 10;
Bloomer No. 2; Bloomer No. 4; Brimley; Fort Wilkins; Lake City; St. Clair;
Straits; Dodge Bros. Menoskong; Grande Point Sable; Little Point Sable.

MINNESOTA.—Alexander Ramsey, Birch Coulee, Camp Release, Fort Ridgely,
Garvin Heights, Horace Austin, Inter-State, Itasca, Jay Cooke, Lake Bemidji,
Mnncopa, Minnesota Scenic, Scenic, Sibley, Sleepy Eye Lake, Toqua Lakes,
Traverse des Sioux, White Water, Wood Lake, Lake Chetek, Pipestone, Chim-
ney Rock.

MISSISSIPPI.—None.

MISSOURI.—Alley Spring State Park, contains a spring with average daily
flow of 55,000,000 gallons from under a cliff into a spring branch which in a
mile joins Jack's Fork; Bennett Spring; the Big Spring State Park; the
Mark Twain State Park; the Round Spring State Park; the Sequiota State
Park; the Ellington Tract; Montauk; Franklin; Arrow Rock; Sam A. Baker;
Glechrist.

MONTANA.—Stillwater State Forest, Swan River State Forest, Coal Creek
State Forest, Sula State Forest, Thompson River State Forest, Clearwater
State Forest, Lincoln State Forest.

NEBRASKA.—Chadron State Park, Arbor Lodge, Victoria Springs, Fonti-
nelle Forest, Stolley Park. *Public fishing grounds.*—Goose and Alkali Lakes,
Walgren Lake, Rat and Beaver Lakes, Frontinelle Forest.

NEVADA.—*Recreation grounds and game refuges.*—Elko County, Jarbridge
State Recreation Grounds; Elko County, Humboldt State Recreation Ground;
Humboldt County, Santa Rosa State Recreation Ground and Game Refuge;
Nye County, Grant State Recreation Ground and Game Refuge; Nye County,
Reese River State Recreation Ground and Game Refuge; White Pine County,
Lehman State Recreation Ground and Game Refuge; White Pine County, Schell
Creek State Recreation Ground and Game Refuge; Lincoln County addition
to Grant State Recreation Ground and Refuge; Washoe County, sanctuary
for antelope north of Smoke Creek desert along California-Nevada line;
and for quail and pheasant along Truckee River; also Storey County addition,

for quail and pheasant; Clark County; Lander County, State Recreation Ground and Game Refuge; State Recreation Ground and Game Refuge) for antelope, White Pine County; public domain in Churchill County; Lincoln County, Cathedral Gulch State Recreation Ground and Game Refuge; Clark County, Flaming Fire State Recreation Ground in the vicinity of St. Thomas; Lehman Caves; Pueblo Grande.

NEW HAMPSHIRE.—*Forests and reservations.*—Miller Park, Cathedral and Horse Ledges, Monadnock Haven, Harriman-Chandler, Crawford Notch, Merriman, Huckins, Everett, Walker, Davisville, Alton Bay, Mast Yard, Sentinel Mountain, Livermore Falls, Blue Job, Mascoma, Litchfield, Salmon Falls, Bear Brook, Sugar Hill, Kearsarge, Jeremy Hill, Cardigan Mountain, Honey Brook, Stoddard, Dodge Brook, Black Mountain, Scribner-Fellows, Contocook, Nottingham, Pownah, Craney Hill, Taylor, Pillsbury; Marshall, Conway Common Lands, Beech, Fox, Annett, Annett, Green Mountain, Glover, Welton Falls (two of this name), Pawtuckaway, Blair, Red Stone. *Forests.*—Lead Mine Bridge, Shelbourne; Snyder Brook, Randolph; Joseph Story Fay, Woodstock; Farrar, Pack Monadnock Temple; South Baldface Chatham; Kearsarge (Pequanwet) Chatham; Rhododendron; Fitzwilliam; Sky Pond, New Hampton, Walter R. Davis Memorial, Jackson; Mount Sunapee, Sunapee; Lost River, Woodstock; Roadside Pines; Tanworth; Masonian Reservation, Dublin and Jaffrey; Primeval Pine Trees, Sutton; Derby Woods, Dublin, Mount Monadnock; Royal Arch, Springfield; Cathedral Woods, Conway; Beaver Meadows, Woodstock; Frank West Rollins Memorial, Warner, Mount Kearsarge; Richard M. Colgate Memorial, Sunapee; Hillside adjoining Royal Arch, Springfield; City Hill, Nelson.

NEW JERSEY.—Bass River State Forest, Jackson Forest, Lebanon Forest, Mount Laurel Forest, Penn Forest, Stokes Forest, Swartswood Lake Park, Washington Crossing Park, Hacklebarney Memorial State Forest Park, High Point State Park, Palisades Interstate.

NEW MEXICO.—None.

NEW YORK.—*Finger Lake State Parks.*—Watkins Glen, Enfield Glen, Buttermilk Falls, Taughannock Falls, Fillmore Glen, Montour Glen, Bluff Point. *Forest reserves.*—The Adirondack Park, Mount Marcey, the Catskill Park, Lake George, Tongue Mountain, John Brown's Farm, St. Lawrence Reservation or International Park, Saratoga Springs, Curtis Game Preserve, Boonville Gorge, Taconic Park. *Palisades Interstate Park in New York and New Jersey.*—Blauvelt Rifle Range, Bear Mountain, Hook Mountain, Storm King Cove, Highlands-Ramapo area is called the Harriman Park. *Harriman section.*—Kanawauke chain of lakes, Lake Stahabe, Lake Tiorati, Upper and Lower Twin Lakes, Upper and Lower Cohasset Lakes, Summit and Barges Lakes. *Westchester parks.*—Mohansic Park; Manursing Island Park; Croton Point; Tibbets Brook Valley; Woodlands Lake; Glen Island; Hutchison River Parkway; Silver Lake Park; Kingsland Point Park; Saw Mill River Parkway, Crugers; Saw Mill River Parkway Extension; Hutchison River Parkway Extension; Cross-county Parkway; Saxon Woods Park; Mamaroneck River Parkway; golf course along the Mamaroneck River at North Street, White Plains; Pelham-Port Chester Parkway; Glen Island approach; Silver Lake Park additions; Splain Brook Parkway; connection from Bronx Parkway to Albany Post Road; additional appropriation, Tibbets Brook and Nepperham Heights Parkway; additional lands, Nepperham Heights Parkway; Hutchison River Parkway additions; Croton River Parkway; Poundridge Reservation; Rye Beach. *Long Island State parks.*—Jones Beach, Fire Island, Deer Range State Park, Montauk Point. *Niagara Falls Reservation. Historic reservations.*—John Boyd Thacher Park; Stony Point Battle Field Reservation; John

William Draper Memorial Park; the Andre Monument at Tappan; Philipse Manor Hall, at Yonkers; Diamond Island Park; Fort Brewerton, an earthwork of the colonial period, in Hastings, Oswego County; Battle Island Park; Lake George battle ground; Crown Point; Letchwork Park. *State Museum*.—Clark Reservation, Lester Park, Stark's Knob, Squaw Island, Chittenango Falls Park. *Historical sites*.—Bennington battle field, Washington's headquarters, Spy Island, Montcalm Park, Newton battle field, Sir William Johnson Mansion and Blockhouse, the Herkimer Homestead, the Guy Park House in Amsterdam, the Schuyler Mansion in Albany, Fort Crailo in Rensselaer, the Senate House at Kingston, the Saratoga Battle Monument, the Grant Cottage at Mount McGregor.

NORTH CAROLINA.—Mount Mitchell State Park, Fort Macon State Park, Rôndevous.

NORTH DAKOTA.—Walhalla State Park; Fort Abercrombie State Park; Fort Abraham Lincoln State Park; Fort Rice State Park; Arikara Indian Village; Pembina State Park; Camp Atchison-historical site; Fred Smith State Park; Homer State Park; McPhalls Butte historical site; Camp Kimball historical site; J. S. Weiser State Park; Streefer State Park; Deaf Buffalo, Kidder County; Hunting Lodge, Butte; Fort Berthold; Camp Coruing, Barnes County; Fort Diltz, Bowman County.

OHIO.—*Canal reservoir lakes*.—Lake St. Mary's, Indian Lake, Buckeye Lake, Portage Lakes, Loramie Reservoir. Dean Forest; Waterloo Forest; Scioto Trail State Forest; Pike State Forest; Spiegel Grove State Park, the homestead of President Rutherford B. Hayes, at Fremont; Logan Elm Park, a small tract surrounding the elm under which the Indian Chief Logan is said to have read the message of Lord Dunmore, at the conclusion of a treaty of peace in 1774; Fort Ancient, 310 acres inclosing the earthworks of what has been called the masterpiece of the mound builders in the Ohio Valley; Serpent Mound State Park, an earthwork in the form of a huge serpent, 1,254 feet long, swallowing an egg; Big Bottom Park, scene of a massacre of 14 whites by Indians, January 2, 1791; Fort Laurens, site of fort erected in the northern part of Tuscarawas County in 1778; Schoenbrun Park, site of village of Schoenbrun, founded by Moravian missionaries in 1772; Fort St. Clair Park, near Eaton, site of battle with Indians in 1792; Site of Fort Amanda, built in War of 1812, includes military cemetery; Miamisburg Mound, Montgomery County, largest prehistoric mound in the State; Site of Battle of Fallen Timbers, where General Wayne defeated Indians in 1794; Tecumseh State Park, site of battle of Piqua, and birthplace of Indian Chief Tecumseh, in Clark County. Dean, Shawnee, Pike, Scioto Trail, Waterloo.

OKLAHOMA.—None.

OREGON.—Bradley Park, at Clatsop Crest on the Columbia River Highway in Clatsop County; Ditto Park, 1.88 acres, on the Columbia River Highway near Rainier, Columbia County; Holman Park, Salem; Helmick Park, Polk County; Mayer Park, Wasco County; Emigrant Park, Umatilla County; Booth Park, Douglas County; Memaloose Park, Wasco County; Viento Park, Hood River County; Chandler Park, Lake County; Bonneville-Cascade Locks Park; Emigrant Hill Park, Umatilla Indian Reservation; Gangloff Park, Union County; Hunters Head Park, Curry County; Bolter Bay Park, Lincoln County; Otter Crest Park, Lincoln County; Rocky Creek Park, Lincoln County; Florus Creek Park, Curry County.

PENNSYLVANIA.—Michaux and Mont Alto States Forests, Mont Alto State Forest, Buchanan State Forest, Tuscarora State Forest, Rothrock State Forest, Logan State Forest, Penn State Forest, Karoondluha (Bald Eagle)

State Forest, Moshannon State Forest, Sproul State Forest, Sinnemahoning State Forest, Tiadaghton State Forest, Elk State Forest (district), Susquehannock State Forest, Tioga State Forest, Delaware State Forest, George W. Childs State Forest Park, Hairy John's State Forest Park, Caledonia State Forest Park, Mount Alto State Forest Park, Valhalla State Forest Park, James Buchanan State Forest Park, Leonard Harrison State Forest Park, Snyder-Middleswarth State Forest Park, Coxe's Valley View, Cherry Springs Drive, Laurel Summit. *State forest monuments.*—Martin's Hill State Forest Monument, Joyce Kilmer State Forest Monument, Ole Bull State Forest Monument, Mount Riansares State Forest Monument, Alan Seegar State Forest Monument, Mount Logan State Forest Monument, McConnell Narrows State Forest Monument, Bare Meadows State Forest Monument, Detweiler Run State Forest Monument, Adams Fall, Davling Run, Baldwin, Kooser, Prouty Place, Patterson. *State parks.*—Valley Forge Park, Washington Crossing Park, Pennsylvania State Park and Harbor, Paoli Parade Ground, Camp Curtin, Fort Washington Park.

RHODE ISLAND.—Woonasquatucket Reservation, Mashapaug Pond Reservation, Edgewood Beach, Stillhouse Cove, Metcalf Field, Corliss Park, West River Reservation, Seekonk River Reservation, Neutaconkanut Hill Reservation, Narragansett Parkway, Dr. George B. Haines Memorial Park, Nausauket Beach Reservation, Arnolds Neck, Chepiwanoxet Reservation, Barrington Parkway, Pawtuxet River Reservation, Lincoln Woods Reservation, Ten Mile River Reservation, Meshanticut Park.

SOUTH CAROLINA.—None.

SOUTH DAKOTA.—Custer State Park, in the Black Hills.

TENNESSEE.—Reelfoot Lake.

TEXAS.—Washington Park, Goliad State Park, San Jacinto State Park, Gonzales Park, King's Park, Mary Campbell, Barreda, Weslaco, Beeville, Fredericksburg, Katemey, Malstrom, Eden, Johnson, Foster, Big Spring, F. M. Weaver, Tahoka, Plainview, Wayside, Ferguson Bros., Memphis, Stanford, Abilene, Mother Neff, Balton, Dilley, Macken, Mayhew, Thomas, Fort Stockton, Goldthwaite, Burg, Tipo, Boerne, Schreiner, Robinson, Buescher, Champion, Goree, Jefferson Davis, Young, John Henry Kirby, Cleburne, Linden, Marshall, Atlanta, Ross, De Kalb, Leonard, Gardner Memorial, Kirbyville, Rusk, Montgomery County.

UTAH.—None.

VERMONT.—George Aitken, Arlington, Battell, Charles Downer, Groton, M. J. Hapgood, L. R. Jones, Lyndon, Mansfield, Proctor-Pipe, Putnam, Townshend, West Rutland, Mount Philo State Park, Camel's Hump, Calvin Coolidge.

VIRGINIA.—State Forest.

WASHINGTON.—Moran State Park, Deception Pass State Park, Larrabee State Park, Bay View State Park, Twanoh State Park, Mahler State Park, Sequim Bay, Schafer, Millersylvania Memorial State Park, Polson, Matilda N. Jackson State Park, Lewis and Clark State Park, Crawford, Vashon, Island, Rigney, Redmond, Black River, Zillah, Alger, Clearwater, Olympic Peninsula.

WEST VIRGINIA.—The Four H Camping Parks; Berkeley Springs; James Rumsey, who invented a steamboat prior to Robert Fulton and made it run on the Potomac; Moundsville; Point Pleasant.

WISCONSIN.—Devils Lake, Peninsula, Nelson Dewey, Interstate Park, Pattison, Perrot, Brule, Cushing Memorial Park, Belmont, Rib Hill. *State forests.*—Ashland, Bayfield, Burnett, Douglas, Forest, Florence, Iron, Marinette, Oneida, Polk, Price, Rusk, Sawyer, Taylor, Vilas, Washburn.

WYOMING.—Big Horn Hot Springs State Reserve.

PICTURES

From *Perry Picture Co.*—The Lake, Dance of the Nymphs, Spring (Corot); Forest Pool, Forest Road (Lambert); Evening's Cooling Shades (Chwala); Spring (Knäus); September, Zuber); Frightened Bather (Mme. Demont-Breton); The Sanctuary (Landseer); Sunset in the Forest at Fontainebleau (Rousseau). Forests, Grand Canyon, Terraced Rocks, Yellowstone Park, Niagara Falls, Old Faithful Geyser, A Mountain River, A Mountain Lake, American Bald Eagle, Mallard Duck, Canvas-back Duck, Wood-duck, Snowy Heron or Little Egret, Mandarin Duck, Prairie Hen, Great Blue Heron, Pintail Duck, American Coot, White Ibis, Brandt's Cormorant, American Bittern, Golden Orioles, American Blue Jay, Red-headed Woodpecker, Bobolink, Wren, Black Wolf, Coyote, Mountain Sheep, Raccoon, Common Mole, Weasel, Gopher, Mink, Muskrat, American Elk, Walrus, Polar Bear, Ferret. Flowers in natural colors.—Goldenrod, American Mistletoe, Iris, Yellow Lady's Slipper and Painted Cup, Swamp Rose Mallow, Late Purple Astor, Black-eyed Susan, Mountain Laurel, Trailing Arbutus.

From *Elson Art Publication Co.*—Dawn (Eggleston); Summer Afternoon (Benson); Catching Minnows (Curran); Deer in Forest (Bonheur); Mellon Eaters (Murlilo); Prince Don (Valesquez); On the Beach (Blommers); Fog Warning (Homer); Dawn (Eggleston); Helping Hand (Renouf).

From *the University Prints.*—Entrance to the Forest (Ruisdael); Dancing Nymphs (Werff); The Blind Fiddler (Wittke); Wood Near Corvud (Gainsborough); Nonpollan Fisherboy (Rude); Nymphs Bathing (Girardon); Diana With the Stag (Goujon); By the River Side (Lerolle); Poplars (Monet); Dancer (Degas); Poor Fisherman (Chavanne); Falcon Hunt (Fromentin); Stag's Thicket (Courbet); Pen Drawing of Oak Trees, Oaks (Rousseau); Oak Tree (Dupré); In the Forest (Penya); Matinee (Corot); Reunion of Comedians in a Park (Pater); The Piper (William Blake); Larch, Park and Forest (James Duffield Harding); Marsh with Storks (Danbigny); The Large Tree (Jan Both); Three Trees (Rembrandt); Three Stags, (da Modena); The Scout (Dallin); Black Hawk (Taft); General Sherman, Robert Louis Stevenson, Abraham Lincoln (St. Gaudens); James Whitcomb Riley (Sargent); Path in the Woods (Weir); Washington Surrendering His Commission (Blashfield); Adirondack Brook (Wynnt); Landing of the Pilgrims (Boughton); Rocky Mountains (Bierstadt); Lake George (Kensett); Washington Crossing the Delaware (Lentze); In the Woods (Durand); River Glimpse (Doughty); Landing of Columbus (Vanderlyn); Thomas Jefferson (Stuart); Oxbow of the Connecticut (Cole).

From *Brown's Famous Pictures.*—Dance of Children, Pond of Ville-d'Array, (Corot); The Rainbow (Millet); The Ferryman's Daughter (Adam); The Pilot (Renouf); Summer Evening (Adam); Turkey Keeper (Breton); Sheep in Pasture (Auguste Bonheur); Pasture in the Forest (Jacque); Landscape with Sheep (Troyon); Trumpeters and Dancing Boys, Dancing Boys with Cymbals, Children Dancing to Sound of Fife and Tambour (Della Robbin); Dancing Boys (Donatello); The Sanctuary (Landseer); Boats at Low Tide (Ravanne); Forester's Daughter (Ansdell); The Deer Pass (Landseer); Children Playing (Voegel); Return of the Oyster Fishers (Feyon-Perrth).

From *Keystone View Co.*: Wild Ducks and Geese, Great Blue Heron, Blue Heron Nests, Nest and Egg of Loon, Black Tern, Black Tern Young in Nest, Nest and Eggs of Marsh Hawk, Nest and Eggs of Sparrow Hawk, Woodcock Hen on Nest (back view), Woodcock Hen on Nest (side view), Night Hawk on Nest, Male Partridge or Ruffed Grouse Drumming, Ruffed Grouse (female), Nest of Ruffed Grouse, Quail's Nest, Gray Wolf, American Red Fox, Black or Silver Fox, Badger, Black Bear Cubs, Bears Feeding in the National Park, Young Seals Sportng on the Beach, Hedgehog and Young, Group of Common Bats, Grey Squirrel, Woodchuck or Ground Hog, American Beaver, Two Dams and Beaver House Between, Bison, Bison-Cow and Calf, A Herd of Bison, Rocky Mountain Sheep, Rocky Mountain Goat, Prong-horned Antelope, A Pair of American Elk, Rocky Mountain Mule Deer, Moose, Herd of Reindeer, Head of Whale, Skinning Whale, Opossums, Man-eating Crocodiles, Big Alligators, Box Tortoise, Pine Snake, Black Snake, Rattlesnake.

From *Forest Service, United States Department of Agriculture*: Sets of about 50 colored slides, each set accompanied by a syllabus for a lecture, will be loaned for short periods on condition that borrowers agree to pay transportation charges, to be responsible for slides lost or broken, and to forward slides promptly and in good condition at the direction of the Forest Service. Applicants must state that they agree to these conditions. The subjects upon which sets are available are as follows:

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READING LESSONS

REST AND RECREATION

Silent reading. Grades IV, V, VI:

Fourth Readers

How Theodore Roosevelt overcame his handicap; A boy's song (James Hogg); What the wood fire said (Frank L. Stanton); Taking lunch with a wild grouse (Ernest Harold Baynes); The Fisherman (John G. Whittier)—Elson. The cave boy; Swimming hole neighbors; Sharp eyes; Lost in the woods (Mary T. Colton); King good health wins; The lobster and the crab—Study Readers. The brook (Tennyson); The song of the Chattahooc? (Sidney Lanier); On a Florida River (Sidney Lanier)—Elson Grammar. Trees (Bjornstjerne Bjornson); Boy's song (James Hogg)—Baker and Carpenter.

Fifth Readers

Robin Hood—Reading literature. A night among the pines (Robert Louis Stevenson)—Gordon. The gladness of nature; Winter sports in Norway—Merrill. A boy's song (James Hogg); An anxious hour (Maria Audubon)—Progressive Road. A day with the Indians (Steward Edward White)—Bobbs-Merrill. Adrift in an open boat (W. Clark Russell); The explorer in the far North; Camp cooking in the far North (Fridtjof Nansen); Backwoods boys of long ago (Steward Edward White)—Modern Readings. A goose hunt in Alaska (Emerson Hough); The song my paddle sings (E. Pauline Johnson); A song of Sherwood (Alfred Noyes); The ships of Yale (Bliss Carmen); A Greek boy at the Olympic games; A Roman boy at play (Jane Andrews)—Field. Boy Scout laws; Bill's bill (Harry Stephen Kieler); Camp-fire girls—Child's world.

Sixth Readers

Alone in a forest (Alphens Hyatt Verrill); The cost of living in the woods (Henry David Thoreau); Ode to the fire; The open fire (Henry Van Dyke); An idyl of the North Sea (Edward Win Bok); The wise use of nature's gifts (Gifford Pinchot)—Literature and Living, Book II. Taking the trail (Emerson Hough); The prairie fire (Herbert Quick); Kenneth buys his outfit (Zane Grey); Lost in the painted desert (Kirk Monroe); The corn and tomato clubs; Our first meal in typee (Herman Melville)—Modern Readings. Mr. Winkle tries to skate (Charles Dickens); Our frontier marksmen (John James Audubon); The forest primeval (Henry W. Longfellow)—Baker and Carpenter. The waste of fire (Angie Ousley Rosser); A forest fire (Dorothy Canfield Fisher); The ring of the ax (Sara Ware Bassett); The scout law; A boy scout; Fun and health—Study Readers. The night riders (John Masefield); Getting ready for a vacation (Jerome K. Jerome)—Field. Our national parks (Robert Sterling Yard); On the beach; How Robin Hood became an outlaw (Howard Pyle)—Progressive Road to Silent Reading. A letter for boy scouts (Theodore Roosevelt); Camp-fire girls of America (Gertrude E. McVern)—Kendall. In Arden forest (Shakespeare)—Bobbs Merrill. A desolate island, chapter 2; A voyage of discovery, chapter 3; A successful voyage, chapter 5; A night's lodging, chapter 8; A castle in the air, chapter 9; A visit to the tent house, chapter 10; After ten years, chapter 34—Swiss Family Robinson.

FORESTS

The anxious leaf; The maple and the pine—New Educational, 4. Hie away! (Sir Walter Scott); A forest fire (Joaquin Miller); The sugar-plum tree (Eugene Field)—Young and Field, 4. Woodman, spare that tree (G. P. Morris); A walk in the woods (Frances W. Parker)—Standard Classic, 4. The old pear tree (Jean Heurle Faber);

The gift of the olive tree (Greek Legend)—Child-Library Readers, 4. Rhoecus-Greek Myth; Three trees; Adventures of Robin Hood—Child World, 4. How the leaves came down (Susan Coolidge); Hiawatha's Childhood (Henry W. Longfellow); The pebble and the acorn (Helen Flag Gould); Wishing (Wm. Allingham); The little land (Robert Louis Stevenson)—Wheeler's Literary Readers, 4. What the wood-fire said (Frank L. Stanton); Early settlers (John James Audubon); Planting the tree (Henry Abbey); How the leaves came down (Susan Coolidge); May (George Macdonald); The tree (Bjornstjerne Bjornson); The miraculous pitcher (Nathaniel Hawthorne)—Elson, 4. Lost in the woods (Mary T. Colton); The old pine's story; Tree twins; The rabbit and the hare (Lena Dalketh)—Study Readers, 4. The last leaf (Oliver Wendell Holmes)—Elson Grammar, 4.

How the cliff was clad (Bjornstjerne Bjornson)—Progressive Road, 5. Pine tree (Ruskin)—Cyr, 5. Conserve your birthright (J. H. Wallace); Woodman, spare that tree (G. P. Morris); Facts about trees; Three trees (C. H. Crandall); Birds' song of spring (E. Nesbit); The fruit tree (L. Bailey); Four apple-trees (E. Poulsson)—Farm Life, 5. Apple-Seed John—Study Readers, 5. Spring—Merrill, 5. A night among the pines (Robert Louis Stevenson); The mulberry tree (Thomas Love Peacock)—Gordon, 5. The job-stick (Emerson Hough); City trees (Edna St. Vincent Millay); Kenneth wants to study forestry (Zane Gray); A woman fire under (Helena H. Smith)—Modern Readings, 5. A journey in Florida (John James Audubon)—Field, 5. Plant a tree (Lucy Larcom)—Child's World, 5.

Forest fires (Overton Westfield Price); The heart of the tree (Henry Cuyler Bunker); What do we plant? (Henry Abbey); John Applesseed (Elizabeth Harrison)—Literature and Living, Book II. When old forests fall (Arthur Newton Pack); Lost in the painted desert (Kirk Monroe)—Modern Readings, 6. The planting of the apple tree (William Cullen Bryant); Under the greenwood tree (Shakespeare); The curate and the mulberry tree (Thomas Love Peacock)—Baker and Carpenter, 6. The oak for the National tree—Study Readers, 6. Stories found in old trunks—Study Readers, 6. The planting of the apple tree (William Cullen Bryant)—Progressive Road to Silent Reading, 6. Trees (Joyce Kilmer)—Magee, 6. The brave old oak (Henry F. Chorley); Evergreen (Edward C. Plunkney)—Aldine, 6. The stag and the cherry tree (Baron Munchausen)—Kendall, 6. The planting of the apple tree (William Cullen Bryant)—Robbs Merrill, 6. Lumbering in the big timber country (Ralph D. Paine); Brier Rose (Bjorne Bjornson)—Barnes, 6. Plant a tree (Lucy Larcom)—Riverside Literature, 6. The India rubber tree, the hollow tree, Chapters XVI and XVIII; Guava, Chapter XV; Where different trees come from, Chapter XVIII; Fir and terebinth, Chapter XXI—Swiss Family Robinson.

ANIMALS

Silent reading, Grades IV, V, VI:

Fourth Readers

The wonderful tar baby (Joel Chandler Harris)—Young and Field. Bruin's boxing match; The old possum and her kittens—Child Library. Balsam and the bear (Charles Major); The third way out—Child World. Master Rabbit as a fisherman—Wheeler's Literary. Pioneer days (David Crockett); The squirrels at Walden (Thoreau); How the chipmunk got his stripes (Flora J. Cooke); Mishook, the Siberian cub—Russian Tale—Elson. The rabbit and the hare—Study Readers. The mock turtle (Lewis Carroll); A rat tale—Carroll and Brooks. The hound of the plains, the coyote (Ernest Ingersoll); Mr. Sequin's goat (Alphonse Daudet); Monarchs in exile, the bison (Mabel Osgood Wright); The pet lamb (Wm. Wordsworth); The mountain and the squirrel (Ralph Waldo Emerson); Our gray squirrels (Ernest Ingersoll)—Baker and Carpenter.

Fifth Readers

Mowgli's brothers (Rudyard Kipling); How Buffalo Bill got his name; The raccoon (Samuel Scoville, jr.)—Progressive Road. The mouse tower on the Rhine—Columbia. The biography of a beaver (Hubert); The panther hunt (J. J. Audubon); Hunted by a bear (Charles Reard)—Farm Life. Buffalo hunt (J. C. Fremont)—Sprague. The mountain and the squirrel (Ralph Waldo Emerson)—Wheeler's Literary. What the fawns must know (Wm. J. Long)—Barnes. When you meet a bear (Wm. Long)—Study Readers. The bison track (Bayard Taylor)—Merrill. The buffalo—Gordon. A luncheon guest (Steward Edward White); Fighting off the bears (Allen Chapman); Killing a grizzly (Emerson Hough); An Arctic water-baby (Samuel Scoville, jr.)—Modern Readings. Bruin's boxing match (G. D. Roberts); The mole's picnic (Kenneth Grahame); The ghost of the buffaloes (Vachel Lindsay)—Field. A French bear story (Alexandre Dumas); The swamp fox (William Gilmore Simms)—Child's World.

Sixth Readers

Critical moments with wild animals (Ellen Veivin); The taming of animals (Peter Chalmers Mitchell); What the earliest men did for us (Smith Burnham); Roast pig (Charles Lamb)—Literature and Living, Book II. A yellow dog (Booth Tarkington); The timber wolf (Stewart Edward White)—Modern Readings. A narrow escape (Charles Read)—Baker and Carpenter. His first real hunt (Herman Hagadorn from Boy's Life of Theodore Roosevelt)—Progressive Road to Silent Reading. Red fox (Charles G. D. Roberts)—Wheeler's Literary. The plaint of the camel (Charles E. Carry); How I became a naturalist (Theodore Roosevelt)—Magee. The white seal (Rudyard Kipling)—Kenfall. American bighorn sheep (Theodore Roosevelt); How an elk swam to safety—Elson. A night with a wolf (Bayard Taylor); The actor and the pig (Phaedrus)—Bobbs Merrill. A cry in the night (William J. Long); Reading the snow (Jim Smiley)—Barnes. Kangaroo (Chapter XI); The muskrats (Chapter XXVII); Bears in a cave, Rabbits, Tanning bear skins (Chapter XXIX); Making hats of skin, Making boats of skin (Chapter XXX); A walrus (Chapter XXXI); Antelopes, Buffalo lick (Chapter XXXII); The hyena (Chapter XXXIII)—Swiss Family Robinson.

BIRDS

Silent reading, Grades IV, V, VI:

Fourth Readers

Om Abe and the war eagle; Bob White; Buds and bird voices (Nathaniel Hawthorne); The coming of spring (Helen C. Bacon); Little Roscoe's canaries, The American robin; How birds protect trees (Florence Merriam)—New Educational Readers. The sandpiper (Celia Thaxter); The swallows (Sir Edwin Arnold); Robert of Lincoln (William Cullen Bryant)—Young and Field. The bird that makes clay pots (Ernest Thompson Seton); A vireo at home (Ernest Harold Baynes); Red riding hood (John Greenleaf Whittier); The whippoorwill (Frank L. Stanton); Bob white, Wheat's ripe (W. T. Whitsett); The wild swans (Hans Christian Andersen); How the bluebird was chosen herald (Jay T. Stocking)—Child-Library. The turkey girl (Judi Folk Tale); Whippoorwill time (Madison J. Caldwell); The music lesson (Jean Ingelow); My robin (Sarah K. Bolton)—Child World. Robin's come (Wm. W. Caldwell); The quails (Jataka Tales); Bob white (George Cooper)—Wheeler's Literary Readers.

Fifth Readers

The Flicker (D. Dauridge); Birds song of spring (E. Nesbit); To a waterfowl (W. C. Bryant); Economic value of birds (Wallace); My lady's plumes, Audubon Society—Farm Life. Spring in Kentucky (James Lane Allen); The albatross (Coleridge); The belfry pigeon (N. P. Willis-Cyr). Sparrows that live in a house (Olive Thorne Miller); The ostrich (Johann D. Wyss); Bird life on the Isle of Shoals (Celia Thaxter); The partridge (Henry D. Thoreau); The hunt as told by a red partridge (Alphonse Daudet)—Gordon. The nightingale and the glowworm; Feathered fairies (Henry D. Thoreau); The comical chebec (Olive Thorne Miller)—Sprague. Robert of Lincoln (William Cullen Bryant); The eagle (Tennyson); The eagle (Hatteras Joe)—Riverside Literature.

Sixth Readers

Stupidity street (Ralph Hodgson); Our vanishing birds (Rudolf C. Croman); A petition of the birds (George Frisbie Hoar)—Literature and Living, Book II. The romance of a swan's nest (Elizabeth Barrett Browning); The eagle (Alfred Tennyson); The eagle and the swan (John James Audubon); To a waterfowl (William Cullen Bryant);—Baker and Carpenter. The cardinal (Gene Stratton Porter); The wist of the wrens (Paul Hamilton Hayne); Hark to the merry birds (Robert Bridges)—Field. The robin (Gilbert Pearson); The song of the lark; The woodpecker (F. E. L. Beal)—Progressive Road to Silent Reading. Webster's quest (James Lane Allen)—Magee. A bird lure (Ivan Turgenov); The mocking bird's song (Joseph Drake)—Aldine. The cardinal bird (Arthur Gutterman); The bluebird (Maurice Thompson); To the cuckoo (John Logan); The humming bird (John James Audubon)—Elson. The little red lark (Katherine Tynan Hinkson); The oriole's nest (Samuel Scoville); The sandpiper (Celia Thaxter)—Bobbs Merrill. Carrier, pigeons, the pigeon house, Chapter XXIII; The ostriches, Chapter XXVIII; The ostrich eggs, Chapter XXIX; The ostrich tamer, The ostrich chicks, Chapter XXX; The Black swans, Birds of Paradise, Chapter XXXIII—Swiss Family Robinson.

FLOWERS

Silent reading, Grades IV, V, VI: King Solomon and the bees (Flora J. Cooke); The apple branch; The flax flower (Mary Howitt)—New Educational Readers, 4. September (Helen Hunt Jackson); Buttercup gold (Laura E. Richards)—Young and Field, 4. The discontented buttercup (S. C. Jewett)—Standard Classic, 4. Goldenrod (Frank Demster Sherman); Talking in their sleep (Edith M. Thomas)—Child World, 4. The yellow violet (William Cullen Bryant); How the flowers grow (Gabriel Setoun)—Wheeler's Literary Readers, 4. The dandelion (Nellie M. Garrabrant); The daffodils (William Wordsworth)—Baker and Carpenter, 4.

The daffodils (William Wordsworth); How plants are produced—Columbia, 5. To the small celandine, Daffodils (William Wordsworth); Trailing arbutus (Henry Ward Beecher)—Cyr, 5. The apple blossoms (W. W. Martin); To blossoms (Robert Herrick)—Farm Life, 5. October's bright blue weather (Helen Hunt Jackson); November (Alice Cary); Jack in the pulpit (Clara Smith)—Wheeler's Literary, 5. Daffodils (William Wordsworth); To the dandelion—Merrill, 5. Under the snow (Katherine Lee Bates)—Field, 5. Four-leaf clovers (Ella Higginson)—Baker and Carpenter, 5. Luther Burbank and his friends (W. K. Tate)—Child's World, 5.

The Rhodora (Ralph Waldo Emerson); To the dandelion (James Russell Lowell); Flower in the crannied wall (Alfred Tennyson)—Baker and Carpenter, 6. The wild flower club (Edna Turpin)—Study Readers, 6. Spring (Henry Timrod)—Wheeler's Literary, 6. The water lily (James Jeffrey Roche)—Wheeler's Literary, 6. Flowers (Helen Keller)—Magee, 6. Sweet Peas (John Keats); Daffodils (William Wordsworth)—Aldis, 6. Daffodils (William Wordsworth)—Kendall, 6. Roadside flowers (Bliss Carman); The dandelion (Helen Gray Cone); Apple blossoms—Elson, 6.

FISH

Silent reading, IV, V, VI:

Fourth Readers

Tom and the lobster (Charles Kingsley); The salmon (David Starr Jordan); The capture of a whale (Frank T. Bullen)—Baker and Carpenter. The lobster (Lewis Carroll) Chapter X; Alice in Wonderland; The whale's story (Louise M. Alcott)—Standard Classic. Hiawatha's fishing (Henry W. Longfellow); The fisherman (John G. Whittier);

Fifth Readers

Turtle riding—Jordan. Trout (David Starr Jordan)—Farm Life. The mock turtle's story (Lewis Carroll)—Robbs-Merrill. Teaching fish to plant buttons (William Atherton Du Puy); The spectre of Tiger Creek (Archibald Rutledge)—Progressive Road. On board a mackerel schooner (Kirk Monroe); Ten thousand times under the sea (James D. Borloux)—Modern Readings. The magic sea shell (John Farrar)—Field. The story of the fisherman (E. W. Lane)—Baker and Carpenter. Billy Topsail—Child's World.

Sixth Readers

Hiawatha's sailing (Henry Wadsworth Longfellow); A fight with an octopus (Victor Marie Hugo)—Literature and Living, Book II. Taking census of the ocean; The hauling of the seine (Kirk Monroe); Swordfishing (Warren Elliott Carlton); The silver horse (Rex Beach)—Modern Readings. The story of the salmon (David Starr Jordan)—Study Readers. A walking trip on Cape Cod (Henry D. Thoreau)—Field. When Tom went fishing (Thomas Hughes); Toads (Oliver P. Jenkins)—Progressive Road to Silent Reading. The silly jellyfish (Lafcadio Hearn)—Magee. The white seal (Rudyard Kipling); An adventure of a whale; Adventure in the stomach of a fish—Kendall. The boy who liked to go fishing—Barnes. Turtle, Chapter XII; Coconut crab, Chapter XV; a school of herring, Chapters XX and XXI; The great green turtle, Chapter XXV; Pearl oysters, Chapter XXXV—Swiss Family Robinson.

GEOGRAPHY

Silent reading, Grades IV, V, VI:

Fourth Readers

The Child's world; The river (S. G. Goodrich)—New Educational. The Northern seal (Mary Howitt)—Halliburton. Hark to the shouting wind (Henry Timrod); Dear Old

Glory, flag for me (Robert B. Rogers); The frost; The windy night (T. B. Reed); The night wind (Eugene Field); The windmill (Henry W. Longfellow); Why the sea is salt; Rain summer (Henry W. Longfellow); The rain-song (Robert Looman)—Wheeler's Literary. A song for flag day (Wilbur D. Nesbit); A story of the flag (Victor Maples); The brook song (James Whitcomb Riley); The rivulet (Lucy Larcome); Raining (Robert Looman); A wonderful weaver (George Cooper); The fisherman (John G. Whittier); Rain in summer (Henry W. Longfellow)—Elson. The cave boy; The story of a rock; Swimming-hole neighbors—Study Readers. The brook (Tennyson); The song of the Chatahochie (Sidney Lanier); The cataract of Lodore (Robert Southey); My visit to Niagara (Nathaniel Hawthorne); On a Florida river (Sidney Lanier)—Elson Grammar. A song of the sea (Allan Cunningham); The brook (Tennyson)—Bobb's-Merrill. Snowflakes (Henry W. Longfellow); Jack Frost (Hannah L. Gould)—Baker and Carpenter. The rainpool (John Tabbs)—Young and Field.

Fifth Readers

How the cliff was clad (Bjornstjerne Bjornson); The brook (Tennyson); The rescue (E. K. Kane)—Progressive Road. The earth's envelope—Columbia. Flow gently, sweet Afton, Bonnie Doon (Robert Burns); An iceberg (Richard H. Dana)—Cyr. Windy night (Thomas Buchanan Reed); Lost in the swamp; John Ridd's adventures in Bagworthy waters; Among the icebergs (Dana)—Gordon. The wind in a frolic (William Howitt); The song of the river (Abram J. Ryan)—Sprague. The brook (Tennyson)—Riverside-Literature. Sweet and low (Tennyson); The wonderful world (Rands); Do you fear the wind? (Llanolin Garland); The tempest (James T. Fields); The leak in the dike (Theobald Cary); The sands of Dee (Charles Kingsley); The brook (Alfred Lord Tennyson); Invocation to rain in summer (Wm. C. Bennett); The little lazy cloud—Wheeler's Literary. A song of the sea (Allan Cunningham); The brook (Tennyson); The wind and the moon (George Macdonald)—Bobb's-Merrill. States and their names—Study Readers. The brook song (James Whitcomb Riley)—Merrill. Home thoughts from Europe (Henry Van Dyke)—Field. The cloud (Percy Bysshe Shelley); The brook (Alfred Tennyson)—Baker and Carpenter. October in Tennessee (Walter Malone); In a California canyon (John F. Trowbridge)—Child's World.

Sixth Readers

Typhoon (Joseph Conrad)—Literature and Living, Book II. Lost in the painted desert (Kirk Monroe); Travelling in the Arctic region (Fridtjof Nansen); What MacMillan said of the Eskimo on his return—Modern Readings. Volcanoes (Charles Kingsley); An eruption of Mount Etna (Hayard Taylor); Among the shoals (James Fenimore Cooper); The rescue (Elisha Kent Kane)—Baker and Carpenter. John Muir, the lord of skyland (Mary R. Parkman)—Study Readers. The snow (Emily Dickinson); Winter in the marsh (Clifton Scollard); A summer storm (James Russell Lowell)—Field. The North (Vilhjalmur Stefansson); Journeys through the South (Sir Charles Lyell)—Progressive Road to Silent Reading. Before the rain (Thomas Bailey Aldrich); The rainy day (Henry W. Longfellow); The wandering cyclone (Laure E. Richards)—Wheeler's Literary. The birth of an iceberg (Dr. Isaac I. Hayes); A great disaster (Arthur H. Rostrum); The blue grotto (John L. Stoddard)—Magee. Hark to the shouting wind (Henry Timrod); The sea (Harry Cornwall); First exploration of the Grand Canyon of Colorado (Maj. J. W. Powell)—Kenall. The romance of the Soo (Ralph D. Paine)—Barnes. The salt cave, Chapter XX and XXI; White lung or pipe clay, Chapter XXVIII; Asbestos window panes, Chapter XXIX; Buffalo elk, Chapter XXXII—Swiss Family Robinson.

HISTORY

Silent reading, Grades III, IV, V, VI:

Third Readers

Columbus and his son, Diego—Elson. Lincoln's kindness to animals—Riverside. Why George Washington did not become a sailor; Abraham Lincoln and his dog—Winston-Companion. Daniel Boone—Horace Mann. Decoration Day—New Education. Why George Washington did not become a sailor—Child Library. When Lincoln was little; When Washington was a little boy; What Franklin did with a kite—Good Reading.

Fourth Readers

George Washington; Abraham Lincoln—Reading for New York City. Old Abe and the war eagle; Abraham Lincoln—Child Library. A glimpse of Washington; Some glimpses of Lincoln—Elson. Evangeline (Henry W. Longfellow); Lincoln the great commoner (Edwin Markham)—Elson Grammar. The Boyhood of Lincoln—Baker and Carpenter.

Fifth Readers

Daniel Boone—Reading for New York City. Washington's journey (J. T. Headley); Washington crossing the Delaware—Progressive Road. Daniel Boone, the founder of Kentucky; Plantation, George Washington; Plantation, Thomas Jefferson—Farm Life. Two French explorers (Frances Parkman)—Gordon. Evangeline—Barnes. Washington (Daniel Webster)—Merrill.

Sixth Readers

Lewis and Clark; Abraham Lincoln and Slavery; Abraham Lincoln—Reading in New York City. Abraham Lincoln—Standard classic. Daniel Boone (Stewart Edward White); The patriarch, Daniel Boone (Stewart Edward White)—Modern Readings. Early life of George Washington (John S. C. Abbot); Ode for Washington's birthday (Oliver Wendell Holmes); O captain! My captain! (Walt Whitman); Gettysburg speech (Abraham Lincoln)—Baker and Carpenter. Stories of Lincoln; Washington's spy (James Fenimore Cooper)—Study Readers. Daniel Boone and the settlement of Kentucky (Theodore Roosevelt)—Field. Washington's farewell to his army (J. T. Headley); Washington's monument (Robert C. Winthrop)—Progressive Road to Silent Reading. My first uniform (Ulysses S. Grant); Remember the Alamo (Theodore Roosevelt)—Magge. General Lee's letter to his sons (Robert E. Lee); The blue and the gray (Francis M. Finde)—Aldine. Washington and the American Army (Nathaniel Hawthorne)—Elson. Washington and the American Army (Nathaniel Hawthorne); Daniel Boone and the founding of Kentucky (Theodore Roosevelt); Uncle Joe's Lincoln (Edward A. Steiner)—Bobbs-Merrill. The doughboy; America for me (Henry van Dyke); The United States Marines at Chateau-Thierry (William Amon Wolf)—Barnes.

PUBLICATIONS, BY STATES, RELATING TO PARKS

CALIFORNIA

- The burrowing rodents of California as agents in soil formation. By Joseph Grinnell. Washington, Government Printing Office, 1925. illus. 8°. (Reprinted from the Smithsonian report for 1923, p. 339-50.)
- California fish and game. Folder issued by the California Board of Fish and Game Commissioners.
- California's game refuges. By Harold C. Bryant. California Fish and Game. 8:1-34, January, 1922.
- A closed season needed for fisher, martin, and wolverine in California. By Joseph Dixon. Reprinted from California Fish and Game, 11: 23-25. Diagram.
- The common hawks and owls of California from the standpoint of the rancher. By Joseph Dixon. 17 p. illus. 8°. (University of California. College of Agriculture. Agricultural Experiment Station. Circular no. 236. April, 1922.)
- Life zones of Yosemite National Park. By Joseph Grinnell and Tracy I. Storer. p. 125-32. illus. 10°. (Reprinted from Hall's Handbook of Yosemite National Park. New York, Putnam's Sons, 1921.)
- Natural history of the ground squirrels of California. By Joseph Grinnell and Joseph Dixon. Sacramento, Calif., California State Printing Office, 1918. 116 p. illus. 8°. (Reprinted from Monthly bulletin of the State Commission of Horticulture. Vol. 7, nos. 11-12, p. 597-708.)
- Reptiles and amphibians of Yosemite National Park. By Joseph Grinnell and Tracy I. Storer. p. 177-82. illus. 10°. (Reprinted from Hall's Handbook of Yosemite National Park. New York, Putnam's Sons, 1921.)
- Saving the redwoods. Report by Save the Redwoods League. January 1, 1924-February 15, 1925. [Berkeley, Calif., Save the Redwoods League, 1925?] 36 p. illus. 8°.
- State of California Fish and Game Commission. 28th biennial report, 1922-24. Sacramento, Calif., California State Printing Office, 1924. 112 p. illus. 8°.

COLORADO

- See Municipal Facts, published by city and county of Denver, Denver, Colo., for general articles on Colorado.

CONNECTICUT

- The arthrostraca of Connecticut. By R. W. Kunkel. Hartford, Conn., Published by the State, 1918. 261 p. illus. 8°. (State of Connecticut. State Geological and Natural History Survey. Bulletin no. 26.)
- Drainage modifications and glaciation in the Danbury region in Connecticut. By Ruth S. Harvey. Hartford, Conn., published by the State, 1920. 59 p. illus. 8°. (State of Connecticut. State Geological and Natural History Survey. Bulletin no. 30.)
- Guide to Connecticut State parks and forests. Hartford, Conn., State Park and Forest Commission, 1924. 54 p. illus. 8°.
- Guide to the insects of Connecticut. Prepared under the direction of Wilton E. Britton. Part I, General introduction, by Wilton E. Britton. Part 2. The eulexoptera and orthoptera of Connecticut by Benjamin H. Walden, Hartford, Conn., 1911. 169 p. illus. 8°. (State of Connecticut. State Geological and Natural History Survey. Bulletin no. 16.)
- The quaternary geology of the New Haven region, Connecticut. By Freeman Ward. Hartford, Conn., published by the State, 1920. 78 p. illus. 8°. (State of Connecticut. State Geological and Natural History Survey. Bulletin no. 29.)
- Report of the State Park and Forest Commission to the governor. June 30, 1922. Hartford, Conn., published by the State, 1922. 68 p. illus. 8°. (State of Connecticut. Public document no. 60.)
- Report of the State Park and Forest Commission to the governor. June 30, 1924. Hartford, Conn., published by the State, 1924. 68 p. illus. 8°. (State of Connecticut. Public document no. 60.)

- Report of the State Park Commission to the general assembly, September 30, 1914. Hartford, Conn., published by the State, 1914. 39 p. illus. 8°. (State of Connecticut. Public document no. 60.)
- Report of the State Park Commission to the governor, for the two fiscal years ending September 30, 1916. Hartford, Conn., published by the State, 1916. 30 p. 8°. (Connecticut. Public document no. 60.)
- Report of the State Park Commission to the governor, September 30, 1918. Hartford, Conn., 1918. 36 p. illus. 8°. (State of Connecticut. Public document no. 60.)

ILLINOIS

- Illinois Arbor and Bird Days (Friday, April 13, and Friday, October 26). Compiled by H. T. Swift, Springfield, Ill., issued by Francis G. Blair, superintendent of public instruction, 1923. 64 p. 8°. illus. (Illinois. Department of education. Circular no. 187.)
- Springfield, Ill., 1924. 64 p. illus. 8°. (Circular no. 183.)
- Springfield, Ill., 1925. 62 p. illus. 8°. (Circular no. 193.)

INDIANA

- Clifty Falls State Park. Its attractions and adjacent points of interest, scenic and historical. By George S. Cottman. Indianapolis, Ind., 1925. 54 p. illus. 8°. (Indiana. Department of conservation, division of lands and waters. Publication no. 48.)
- McCormick's Creek Canyon. A history and description. Indianapolis, Ind., 1923. 24 p. illus. 8°. (Indiana. Department of conservation.)
- Turkey Run State Park. A history and description. Indianapolis, Ind., 1923. 54 p. illus. 8°. (Indiana. Department of conservation.)

MASSACHUSETTS

- The commercial forest trees of Massachusetts. How you may know them. A pocket manual. Boston [no date]. 67 p. illus. (Massachusetts. Department of conservation, division of forestry.)

NEBRASKA

- Arbor Lodge State Park, Nebraska City, Nebr. Guide Book.

NEW YORK STATE

- Adirondack canoe routes. By William G. Howard. [Albany, N. Y., Conservation Commission, State of New York.] 22 p. illus., map. 8°.
- Adirondack highways. By C. R. Pettis. [Albany, N. Y., Conservation Commission, State of New York.] 34 p. illus. 8°.
- The Allegany Field and Trail Club. By Frank W. Johnson. Hobbies, 4: 1-20, 1924. 8°.
- Catskill highways. By C. R. Pettis. [Albany, N. Y., Conservation Commission, State of New York.] 14 p. map. 8°.
- Cornell rural school leaflet. Ithaca, N. Y., 1920. 118 p. illus., 8°. (Cornell University, New York State College of Agriculture. Department of rural education. Leaflet, vol. 14, no. 1.)
- First annual report of the State Council of Parks . . . to the Governor and Legislature of the State of New York, October, 1925. 72 p. illus. 8°.
- Forest fires. By William G. Howard. Albany, N. Y., 1921. 8°. (New York. Conservation Commission. Bulletin 10 rev.) 31 p.
- Fortieth annual report of the commissioners of the State reservation at Niagara, July 1, 1922-June 30, 1923. Albany, N. Y., J. B. Lyon Co., printers, 1924. 17 p. 8°. (New York. Legislative document no. 28, 1924.)
- Forty-first annual report of the commissioners of the State reservation at Niagara, July 1, 1923-June 30, 1924. Albany, N. Y., J. B. Lyon Co., printers, 1925. 19 p. illus. 8°. (Legislative document no. 37, 1925.)
- Map and guide of the New York State reservation at Niagara. Issued by the commissioners, 1917.
- Public parks in Westchester County. By Jay Downer and James Owen. 52 p. map. (Reprinted from History of Westchester County, Alvah P. French, ed. New York. Lewis Historical Publishing Co., 1926. 8°.)
- Public use of the forest preserve. By C. R. Pettis. [Albany, N. Y., Conservation Commission State of New York.] 15 p. plan. 8°.
- Report of the Westchester County (N. Y.) Park Commission. [White Plains, N. Y., published by board of supervisors of Westchester County.] 111 p. illus. 8°.

St. Lawrence Reservation. By Arthur B. Strough. [Albany, N. Y., Conservation Commission, State of New York.] 15 p. plan. 8°.

See also Hobbies. Periodical issued by Buffalo Society of Natural Sciences. Buffalo, N. Y. Thirty-seventh annual report of the commissioners of the State reservation at Niagara, for the fiscal year July 1, 1919, to June 30, 1920. Albany, N. Y., J. B. Lyon Co., printer, 1921. 44 p. illus. (New York (State). Legislative document no. 30, 1921.)

Thirty-eighth annual report of the commissioners of the State reservation at Niagara, July 1, 1920-June 30, 1921. Albany, N. Y., J. B. Lyon Co., printers, 1922. 16 p. illus. 8°. (New York. Legislative document no. 58, 1922.)

Thirty-ninth annual report of the commissioners of the State reservation at Niagara, July 1, 1921-June 30, 1922. Albany, N. Y., J. B. Lyon Co., printers, 1923. 17 p. illus. 8°. (New York. Legislative document no. 47, 1923.)

NORTH CAROLINA

Mount Mitchell and Mitchell State Park. A souvenir dedicated to the General Federation of Women's Clubs by the North Carolina Forestry Association and the North Carolina Federation of Women's Clubs. By J. S. Holmes. Chapel Hill, N. C., May 1919. 19 p. illus.

NORTH DAKOTA

Historical scenic views and Bad Lands of North Dakota. Bismarck, N. Dak. [Office of Commissioner of Immigration.] 32 p. illus. 8°.

North Dakota—the best of the West. Bismarck, N. Dak. [Office of Commissioner of Immigration.] 32 p. illus. 8°.

PENNSYLVANIA

State forests of Pennsylvania. By R. Y. Stuart. Harrisburg, Pa., 1925. 34 p. 8°. (Pennsylvania Department of Forests and Waters. Bulletin 37.)

UNITED STATES

Annual Report of the Conference on State Parks. Union Trust Building, Washington, D. C. Miss Beatrice Ward, Executive Secretary.

VIRGINIA

Norfolk, its history, geography, and civic development. A handbook for teachers of the third grade. Norfolk, Va. [Published by superintendent of schools.] 84 p. 8°.