

CONSERVATION EXCURSIONS

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FOREWORD

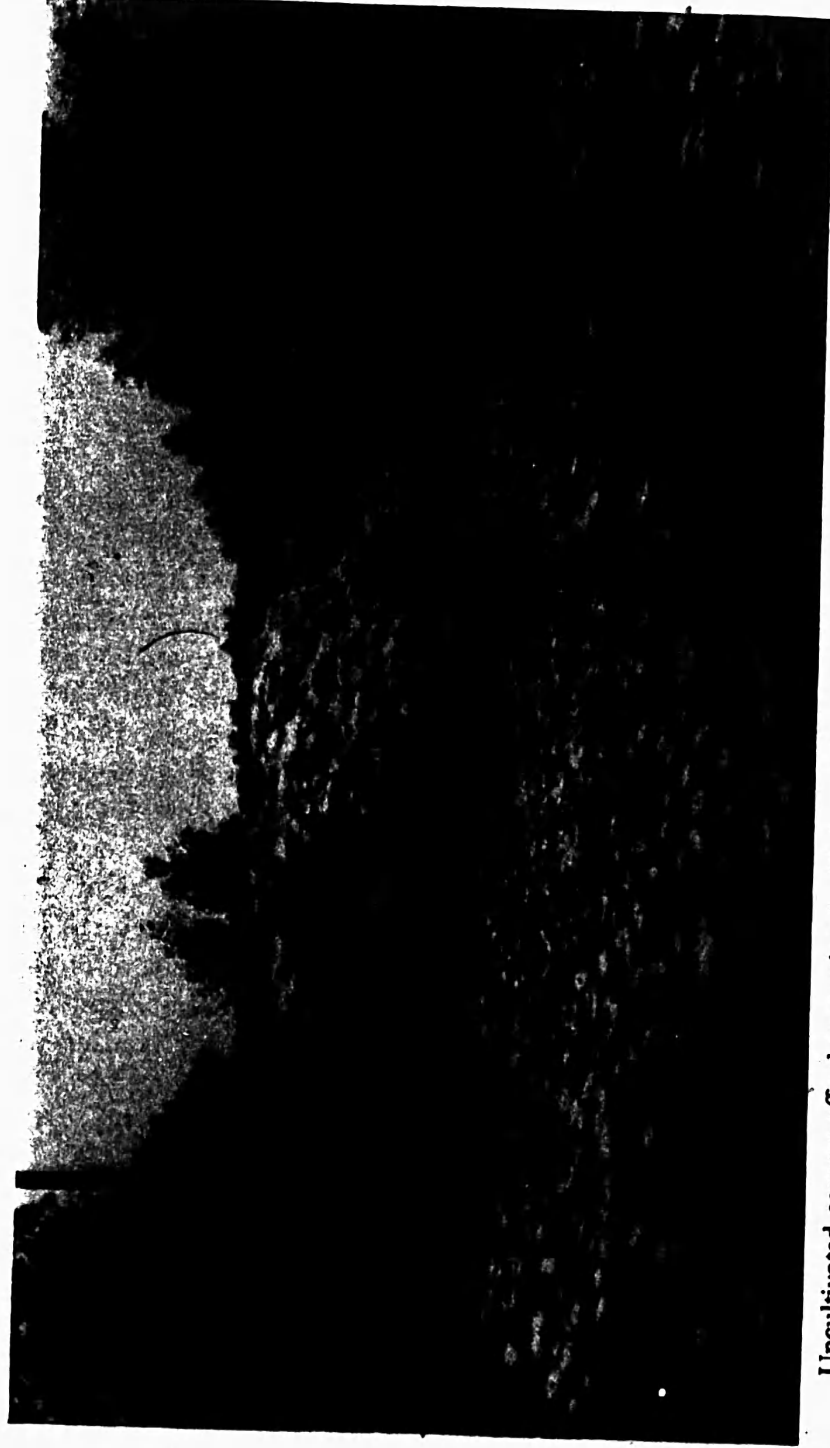
The conservation excursion takes the child out of the school-room and into his natural and social environment and helps him to study it and to participate in the conservation of its natural and human resources. The conservation excursion, like any other school journey, is not intended as a substitute for books, magazines, pictures, or any other classroom material but rather as an important supplement.

The purposes of this bulletin are to indicate educative goals and values which are peculiar to the conservation excursion, to point out particular contributions to curriculum content and activity which can be achieved through excursions for the study of different phases of conservation, and to suggest methods and techniques of planning and conducting excursions for the aid of teachers who are particularly interested in conservation education.

The United States Office of Education wishes to acknowledge the cooperation of the Division of Motion Pictures of the Department of the Interior, the Biological Survey, the Soil Conservation Service, the State Education Department of Connecticut, and the Rochester Museum of Arts and Sciences in furnishing pictures and other material used in the preparation of this bulletin. We are particularly indebted to Irving Brant and Carl R. Dion, of the National Park Service, for reading the manuscript and checking its factual accuracy.

BESS GOODYKOONTZ,
Assistant U. S. Commissioner of Education.

v



Uncultivated corners afford protection for birds and flowers and invite nature lovers to study and enjoy them.

CONSERVATION EXCURSIONS

WHAT A scientific expedition is to the scientist or the hiker to the pleasure seeker, the school excursion often is to the child. It takes him out of familiar surroundings into new ones in which he makes discoveries and learns new facts, not through the abstract words of printed pages, but from the vivid textbook of the environment.¹ Excursions are especially useful in a study of conservation because natural resources in the form of birds, trees, forests, soil, and minerals, which comprise the subject matter to be taught, cannot be brought into the schoolroom in their natural state and pupils must go to them.

The goal of the conservation excursion educatively is not to vitalize subject matter or to develop an excursion program for excursion's sake; but to give the pupils a practical acquaintance with conservation as a problem which is basic to their own and the community's welfare and a working knowledge to help them participate in its solution. Conservation excursions stimulate children to ask questions and these lead to further study which can be made in the schoolroom. They help pupils understand better the facts in books and serve as a check on the accuracy of such facts. Every child naturally feels the tragedy of the Nation's loss of resources and wishes to protect and to save the resources that remain. In the conservation excursion, the urge to conserve is strengthened by a number of pupils with unity of purpose.

A conservation excursion is rarely a unit in itself. It has a subordinate relation to the main program of the school and to major units in the field of conservation. It frequently contributes to the building of a unit on some phase of the subject such as the protection and preservation of wild flowers in the local community. It may contribute to the development of an activity such as the filling of a gully or the establishment of a nature trail. In some cases it is a culminating or summarizing activity which children anticipate and for which they prepare by careful planning and intensive study. In many instances the excursion serves as a stimulant to seek the solution of a problem and is followed by activities which aid in its solution.

¹ Zachari, Elizabeth D. Field trip experiences in the intermediate grades. *Journal of Geography*, 33: 49-60, February 1934.

PURPOSES AND USES OF EXCURSIONS

Children have various purposes in excursions. They like journeys and trips and, when one is suggested, are usually eager with questions and ideas. They make dozens of suggestions for places to visit and things to see. Many educative uses can be made of an excursion, depending upon the purpose of the children and the teacher in planning it. An overview of types of excursions needed in studying the conservation of different natural resources reveals interesting possibilities.

Pleasure Trips

Sometimes an excursion is taken for the pure pleasure of an outdoor hike. It results in appreciation of the outdoors and its benefits. Again, pupils desire to observe something entirely new and interesting to them, such as an unusual bird, a row of trees of particular beauty, a "big ditch" which they have just learned is a dangerous gully.

Some excursions which are taken for pleasure lead to appreciation and knowledge. Children will be amused and stimulated to note such facts as that the gayfeather is an "upside down" flower beginning to blossom at the tip of the stem, and hence down the stem, instead of low on the stem and toward the tip as the gladiolus does. What does this manner of blooming tell about the nature of the plant? When, if at all, can it be transplanted? What flowers should be planted with it to reproduce the natural environment and to insure its best growth? Questions like these and others will arise. Sticktight, Spanish needles, and cockleburs cling to the children's clothes, and are carried back to the schoolroom and to the children's homes where they are frequently undesirable. Why? Such incidents and observations lead to study of migration of plants through seed dispersal.

Nature calls in the spring as well as in the fall, and pupils should be encouraged to plan hikes through the woods for the excitement of seeing fuzzy heads of baby ferns and stroking the velvet buds of pussy willows; of marveling at the bold coloring of the skunk cabbages contrasted with the more delicate greens of the willows and the mysterious tiny plants appearing on the woods' floor; of listening to the disturbed chirping and calling of birds and trying to recognize them by their notes; of trying to find out how to protect and preserve such beauty. Until he thrills at the exquisite loveliness of the snowdrop, feels an urge



Excursions for recreation: (1) Nature Trail Club ready for journey. (2) From "ski-top" at Badger Pass, Yosemite. (3) Nature Trail Club pauses at favorite haunt.

to protect the trusting "fat" robin, and loves the soil that gives him these, no one is a genuine conservationist. A child familiar with the beauty of wildlife will not willingly see it destroyed and will work consistently to protect it. Excursions will put him far along the way of conservation.

Investigation, Discovery, and Study

Children need to take trips to acquire information not available in their classroom or homes. For practically all the natural resources, journeys can be taken to investigate situations and discover new facts. For some time schools have used excursions to industries, mines, fields, and farms in connection with geography and history. Less frequently, but none the less profitably, excursions to study wild flowers and birds are used for general science and nature study. Such first-hand study affords opportunity for pupils to learn more about conservation of natural resources. The following suggestions concern the study of industries, minerals, soil, wild flowers and birds through excursions.

Industries.—Excursions to study industries² suggest problems for investigation, many of which have angles of conservation. The situation of the factory should be noted with respect to its location in a valley by a river or away from the river, with respect to means of transportation and raw material, and with respect to source of power and its maintenance. The watershed can be studied, and the security of the industry from floods. The demand of the factory for raw material and the provision made for protecting the soil in its production are problems in the conservation of industry. The nationality and skill of the workmen, provisions for their safety and health, their future welfare if the industry should not be successful and stable are factors in conservation of industry which older pupils can well study. Children who have become aware of such problems should plan an excursion as part of their study. Byproducts of the industry, waste which may pollute a stream, possible ways of avoiding or disposing of waste are other conservation problems to be studied through excursions.³

² Study of an industry. *Classroom Teacher*, 11: 373-75, 1927.

³ Suggestions for making journeys part of a school program are found in *Expanding the classroom* published by the State Department of Public Instruction of Pennsylvania.

*Minerals.*⁴—Excursions to mines and quarries sometimes reveal conservation needs. Although stone is virtually inexhaustible, there is sometimes waste in its extraction at the quarry. Children can learn about the location of quarries, the machinery used, the hand labor employed, the type of power used, the waste of labor or fuel. Visits to mines reveal forms of mineral deposit. The type of machinery used may have something to do with waste. The nationality of the workmen, the service they render, the wages they receive, the protection provided for their health and social security, and good ways of using their incomes can sometimes be discussed by the older pupils. In the discussion of these and other social problems, a teacher must guide her pupils carefully in order not to cause distress to pupils in the class who are affected by the problems discussed; nor arouse unduly the sympathies of the children about situations which they have no power to help improve and no opportunity to see improved.⁵

One of the minerals with which children have experience is coal. A class can plan a trip to the engine room of the school building where the janitor explains how coal is fed to the furnace, how the quantity of coal used is measured, and how the heat is regulated. Children can observe the coal that is stored for immediate use and gain some idea of the quantity required to heat the building. They can observe a load of coal being placed in the furnace room of the school building, note the appearance of the coal, and compare samples with other kinds of coal.

It is not always advisable or possible for children to be taken into a coal mine. However, there are interesting things to see outside a mine; the machinery used in hoisting coal, in separating good coal from poor, in loading railroad cars, and the like. A discussion of the conservation of coal with the operator of the mine may help the children to realize the efforts that are made to save as much coal as possible. Frequently, it is possible to have the operator talk to the group about the dangers of mining, and explain precautions taken to protect the life and health of the miners. Information of this kind is especially helpful for children who live in a mining district because it is easier to develop a regard for the wisdom of working carefully while they are young, than to teach precautions to adults who have become accustomed to the dangers.

⁴ See also pages 91-93.

⁵ Baker, G. Derwood. An eleventh-grade field study: The coal industry. Educational research bulletin, 18: 173-88, October 19, 1938.

Where petroleum is found, an excursion to petroleum wells is useful and desirable. Children can learn first-hand how wells are bored, why derricks are erected as they are, how petroleum is conveyed to places where it is used. An operator or guide may be secured to talk with the children about the uses and importance of oil in industry and national life and to point out ways in which the product is being conserved in the region visited.

The need for the conservation of petroleum is greater than that of any other mineral, as the supply is limited. It is important that this excursion be made wherever possible.

Natural gas is another interesting substance found in the earth. In regions where natural gas is produced it is well for the children to take a journey to the gas fields. They can compare the sinking of gas wells with the sinking of oil wells. They can observe methods of storing gas and discuss its different uses and later verify the things they learn.⁶

Iron is found combined with other substances. Most of the iron mines are of the open pit type; only a few are shaft mines. Usually children are not allowed to travel about or enter a mine. They can visit the edge or the entrance of the mine, however, and note how the ore is taken out and loaded on freight cars to be carried to the ore boats or the foundry where the mineral is separated from the ore. It will be helpful if the operator tells them how iron is mined, what use is made of inferior ore, and how the product is conserved.

Other interesting places for the children to visit, should the school be located near them, are building-stone quarries; lead, zinc, or copper mines; and gold and silver mines.

*Soil.*⁷—In studying the conservation of soil, excursions are of real importance. The fields, the meadow, the woodlands, and the roadside are textbooks, laboratory, "tools of learning," and materials of instruction.

Many kinds of excursions are possible. Short trips within the community will give the pupils a chance to observe erosion and its control on different farms. Their observation can be continued from month to month, especially in rural areas, to study changes in the amount of soil eroded, the increase in number of control methods in the community and on separate farms, changes that occur in the realization of programs for control, such as

⁶ Rochelleau, William F. *Minerals*. Chicago, A. Flanagan company, 1929, p. 45-68. (The first book of the great American industries series.)

⁷ See also pages 66-68.

increase in size of gullies, the breaking down of terraces, and the beginning thus of gullies through the very means which the farmer uses for control.

Children can learn through excursions how soil is being wasted in their community. A journey to the field, meadow, brook, or roadside near the school reveals undue erosion as a result of wasting of soil, of blowing by the wind, of gullies. City children can plan class trips to the suburbs or take trips as individuals to friends or relatives in the country. In the pasture or near a roadside they probably can find a gully. If it is small, they can follow it



A trip to see men engaged in conservation work offers opportunity for study.

to its head and try to decide what caused it and how it can be controlled. In the field, the children perhaps will find drifts of fine soil, the results of sheet erosion. On barren slopes, once wooded, and on the terraces of deep roadside cuts, tiny gullies known as finger erosion, may be observed.

After a survey excursion of this type, classroom discussion is necessary to formulate questions and problems and make arrangements for further study. The children's questions may lead to a study of soil;⁸ how it is made, what its uses are, how deep it is, and the like. Some of these questions will require

⁸ U. S. Office of Education, Federal Security Agency. Teaching conservation in elementary schools. Washington, U. S. Government Printing Office, 1939. (Bulletin, 1938, no. 14.)

additional field trips. It will be necessary, for example, to dig into the soil to observe the depth of topsoil, to note the quality of subsoil and the type of clay or rock that lies underneath. Observations can be made regarding the type of vegetation that helped form the topsoil, whether forest or grass; the kinds of crops removed; the means of replenishment. A trip to a brook or creek is an opportunity to observe how and where soil is deposited, where the channel is cut away most, whether the waters are muddy or clear, the type of mud they carry, the kind of land through which they flow, whether wooded or plowed. A sketch of the stream and its tributaries with places of greatest erosion indicated will be helpful to the class in further study.

If some of the children are interested particularly in the harm done by erosion, they should visit a field, preferably one with soil that varies in thickness. Here is opportunity for the class to observe the healthiness of the crop at different points on the hill and to try to account for the differences. If it is possible for the pupils to dig into different types of soil for comparison, they will find subjects for study and observation. For example, they can note the difference in composition of the soil on a grassy hillside, the soil of a field of open crop such as corn or potatoes, and the soil on a forest floor. Questions concerning the composition, value, and conservation needs of different kinds of soil thus found can be answered in classroom study.

An excursion after a rain raises questions that lead to study of erosion, or it may help answer questions previously raised. Children should compare the amount of erosion from plowed fields, grassland, or woodland. Estimates of the amount of erosion can be made by noting the muddiness of creeks, the damp soil heaped at the foot of hills, the soil left clinging to grass and weeds where the creek overflowed during the rain. Children can make interesting comparisons between the effect of different kinds of rain on soil. They may note soil loss after a severe storm in which rain fell heavily. They can report evidences of washing, such as soil on grass or plants, or piled at the foot of the hill; the widening of gullies; holes washed in the sides of culverts on dirt roads; gullies swallowing roads and houses. For the sake of comparison, the class can take a similar trip later after a gentle rain lasting for a longer period of time and providing about the same amount of moisture.

An excursion is useful for the study of erosion in pastures where cattle or sheep graze. Children can observe spots where grass has been closely cropped and where heavy rain washes the soil. This type of erosion is especially noticeable in sheep pastures. Gullies are often found in pastures as well as in fields. The tendency of many farmers is to ignore them in pastures even more than they do in fields and consequently each gully grows wider year by year, losing soil with every rain. Children who have opportunity to visit gullies can observe them after each rain during an entire season and make records of their size. The facts can then be arranged in tabular form or in some other way to indicate amount of change in the size of the gully.

Soil erosion, especially in its most spectacular form, the gully, has such dramatic and tragic appeal to children that to give them knowledge of the problem with no opportunity for participating in its solution may have harmful psychological effects. Consequently, excursions to study the amount and effects of erosion in a community should be followed by simple constructive measures in which children can engage. For example, rural pupils can plant vines and shrubs in a small gully near the schoolhouse and make it a refuge for birds. City pupils can follow an excursion to study erosion by another trip to a different farm where they can observe methods of successful control of erosion.

The journey to observe measures of erosion control should be taken by all pupils interested in soil erosion. Grassed waterways, dams in gullies, contour plowing, and the like usually can be observed near the school. However, if the community has not been aroused to the need for erosion control or if the school is located in a city, it may be necessary for the children to plan a journey into a neighboring community. In observing control of gullies children can look for various remedial measures, such as dams of brush, dirt, logs, or rocks; permanent dams; plantings of shrubs and vines, and grassed waterways. They may be able to estimate the age of a controlled gully by the width of its channel, the roundness of its shoulders as compared with the sharpness of a gully which is not controlled, by the growth of trees and shrubs planted in the gully to control it, by the toughness of root growth in the grass covering.

Strip cropping is an interesting type of erosion control to visit. Children observe the types of crops planted in the alternating

strips and note how the close-growing crop, as wheat or alfalfa, protects its soil and collects soil which is washed from the open-growing crop, such as corn. They can estimate the profit that a farmer might make from a field planted with strip crops as compared with that from a single open crop on the same field when the plan is followed year by year. They can follow their study by bulletins on strip cropping.⁸

Erosion control in pastures is interesting to observe. Contour furrowing is a common method. Children can observe how ridges are made and how they are turned at the ends so that water does not break through and form new gullies. They should notice how the furrows are plugged and closed with soil on each side of a trail worn by the crossing of horses, sheep, or cattle.

Teachers and children who take excursions to study soil erosion and its control will find more information of value than is indicated in this bulletin. Questions will arise that demand study. Ideas for appropriate constructive activities will be suggested and other excursions will be needed.

*Wild flowers.*⁹—An excursion to see wild flowers in their native setting adds to appreciation of their beauty and leads one to seek information concerning their conservation. In the country it is not always necessary to go far from school. A group of children who had studied the conservation of flowers found some yellow moccasin flowers in a rock near the school.¹⁰ They decided that these flowers were more beautiful in a native setting than in a bouquet. They learned by reading that the moccasin flower should be allowed to grow and multiply because it is rare. Accordingly, although during the blooming season one or two flowers were kept in a vase at school, the others were allowed to bloom among the rocks and the children made frequent trips to admire them.

A journey to meadow or woods to learn more about wild flowers need consume only an hour or so. There may be a partly sheltered ungraded roadside near the school where, in September, tall goldenrod stand, protecting, as it were, the smaller

⁸ Ibid. (For suggestions for study of various methods of erosion control).

⁹ See also pages 73-76.

¹⁰ Dunn, Fannie W., and Everett, Marcia A. *Four years in a country school*. New York, Bureau of Publications, Teachers College, Columbia University, 1926. p. 164.

white asters, the once cultivated but now wild Bouncing Bet, and the wild snapdragon. One or more excursions can be taken merely to learn the names of the wild flowers of the season. Another excursion can be planned to learn how to identify new flowers. It is interesting to build a list of flowers which one can identify at a glance and at a distance; and interesting also to keep a calendar of those first observed at different seasons together with things learned about them. If pupils wish to make a key for their own use or for younger pupils to use in identifying flowers¹¹ they will find it necessary to make many trips to observe the flowers which bloom at different seasons.

Problems for pupils to consider as a result of their excursions are how the flowers along the roadside can be conserved, whether or not they should be plucked, what flowers can safely be plucked and in what places, and under what conditions wild flowers can be transplanted for wild flower gardens on the school ground. Other journeys will be needed as study and activities are expanded.

By studying the habits of wild flowers in the "home" community children can compile lists of flowers which are abundant and can be plucked in quantity, of those which must be handled with care or in certain ways, and of those which are so rare that they should not be disturbed, and post these in public places.¹²

Where wild flowers grow, materials for study of the conservation of other natural resources are often found. In the wild-flower thicket in the frontispiece, for example, are materials for several excursions; natural beauty in the green billows sprayed with yellow-centered daisies and orange hawkweed and walled in by clumps of elder and wild raspberry vines; extra plants for resetting in the schoolyard or a corner of the home garden; specimens for displays and study in science; hickory and plum trees and protected soil; flowers for bouquets with opportunity to learn how best to pluck them; a haven for the chewink, song sparrow, and meadow lark; chipmunks' holes and a groundhog's home.

¹¹ Duncan, Carl D. Wild flower roads to learning. Science guide for elementary schools, 2: 36-40, March 1936.

¹² Lists of wild flowers which should not be plucked near large centers of population or under certain conditions are published by the Wild Flower Preservation Society, Inc. The home office of the Society is 3740 Oliver Street, Washington, D. C.

*Birds.*¹²—Excursions are necessary for the study of birds, but a class journey to observe birds of the community, to listen to their songs, to study their ways of flying, to observe their nests and food is one of the most difficult excursions for the teacher to undertake. If a journey into birdland is to be successful, teacher and pupils must remain quiet, walk carefully, and in other ways refrain from frightening the birds to be observed.

The most expert flyers and the keenest-sighted birds are the hawks, owls, and eagles. These are of primary importance in controlling field mice, rabbits, and other small animals that decrease the farmer's crops, and they should be given particular attention and appreciation. To watch the effortless flight of a large hawk high above the earth is a long-remembered experience. Children who have camped out of doors will recall the eerie whoo-whoop of the night-loving owl. Many hawks' nests, though they may be high in a tree, are fairly easy to find on a wood's excursion because of their large size. The predatory birds have not been given the credit due them. A few, such as the goshawk, may do more harm than good, but on the whole campaigns against them are often based on prejudice rather than scientific facts.

Near some schools there are waterfowl sanctuaries which may be visited. Moreover, since several species of ducks, geese, swans, and shore birds are verging on extinction, it is very important that the children become acquainted with these birds to appreciate their value. An appealing picture is made by a mallard family when the parents are leading their brood in swimming

¹² Bailey, Alfred M. *At home with the birds.* Chicago, Merrill publishing co., 1934. 15 p., illus.

Boulton, Runyerd. *Traveling with the birds.* Chicago, M. A. Donohue & company, 1933. 64 p., illus.

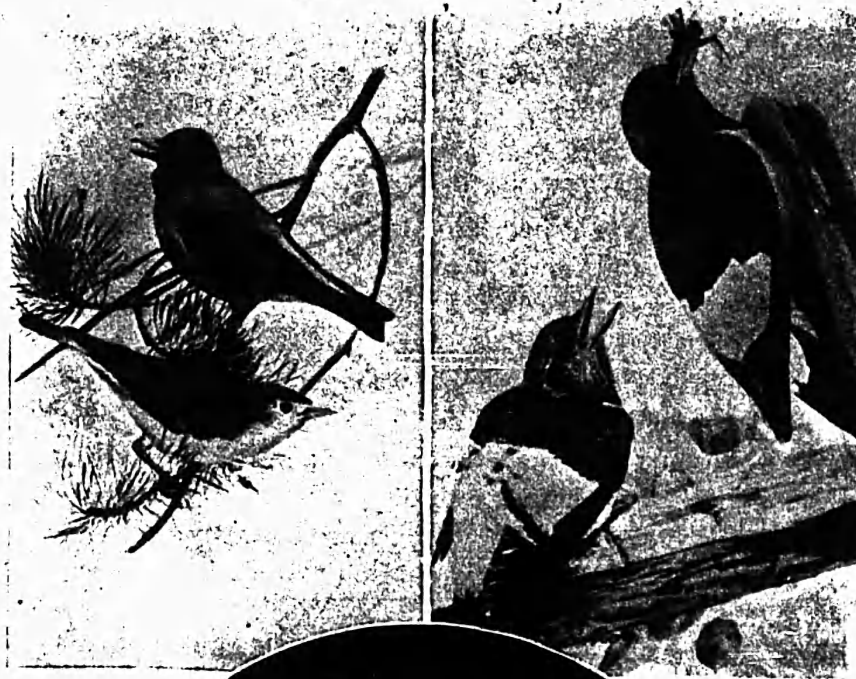
United States Department of the Interior, Office of Education. *Good references on conservation of birds, animals, and wild flowers for use in elementary schools.* Washington, U. S. Government Printing Office, 1938. (Bibliography No. 72. 11 p.)

Educational leaflets about birds prepared by the National Association of Audubon Societies, 1775 Broadway, New York, N. Y.

Allen, Arthur A. *American bird biographies.* Ithaca, N. Y. Comstock publishing company, 1934. 270 p., illus.

See also: Cornell rural school leaflets: (1) *Winter birds*, January 1923; (2) *Shore birds and game birds*, November 1924; (3) *A travelog of birds*. March 1929; (4) *Are they vermin?* November 1937.

See also pages 85-90.



Three types of wild birds to be observed on nature excursions: (1) Scarlet tanager. (2) Wood pecker. (3) Wild turkey.

maneuvers. The antics of a loon will provide much amusement. The short quick steps of the various shore birds and the teetering of some of them on long slim legs is an observation to make.

Much has been written about them which can be obtained from State and Federal departments of conservation and of education.

Birds' ways of living are of interest, such as the way they nest in the orchard, in shrubbery near the house, in woods, and in swamps and marshes. It is not difficult to observe some birds build their nests. The red-headed woodpecker, for example, will pound away at a hole in a tree without great alarm even when a dozen pupils are watching. Like the red-headed woodpecker, the flicker often makes his nest in a tree, near people's homes. With his hard bill and his strong shoulders he can make a large hole. Holes made by woodpeckers and flickers are sometimes used by other birds. The bluebird is an example. Screech owls and sparrow hawks also nest in woodpeckers' holes, especially if they are hammered into the trunks of dead trees and can be easily hollowed. Let the children observe that the hole is sometimes partly hammered and partly broken and crumbled into a large cavity.

By excursions children will learn that birds have various types of building spots, and that many birds do not seriously object to being observed while nesting. Some of them, such as the kingfisher and bank swallow, build their homes in clay banks or cliffs. Burrowing owls often live in prairie dog tunnels. There are many birds that build their nests near dwellings. The robin, song sparrow, and house wren are examples. Of the common birds that live in holes in trees, besides woodpeckers there are bluebirds and martins.¹³

It takes a great deal of disturbance to frighten away birds that are nesting. If one is careful not to startle them by sudden approach or jerking movements, he can come very close to many while they are sitting on their eggs.

Goldfinches are especially interesting birds to study. Children can begin to observe them when they first appear early in the spring. They are not easily frightened by human beings. They nest in trees and bushes and line their nests with thistledown. In July, and sometimes later, in patches of thistles, and darting here and there in their beautiful black, white, and yellow markings, they make lovely contrasts with the purple and white flower heads.

¹³ In Roberts' *Birds of Minnesota* interesting observations of common birds are mentioned.

In addition to noting the habits of birds when nesting, children find it fascinating to observe the nests and the intricate way in which many of them are made. The graceful swinging home of the oriole is an example of complex weaving and artistic shape. The nest is woven from string, thin strips of weeds, and the soft inside bark of trees, and lined with hair or soft feathers. It is a bit disappointing to the onlooker when the oriole's nest becomes so thick that he can no longer see her weave because the diligence with which she works is fascinating. She is a meticulous worker, too, and jealous of her art. One observer of birds reports that a male oriole, while his mate was absent one day, brought a string and tried to weave it into the nest. He worked very awkwardly and without success, however, and when his mate returned she chased him away and scolded him soundly.¹⁴

Unexpected incidents are interesting to people who love birds. For example, the oriole mentioned above became entangled by string which she was weaving into her nest. The observer called a neighbor boy and they strapped the tops of two long ladders together in such a way that the boy could climb one ladder and cut the string with a pair of shears. This released the bird, and, although badly frightened, she was none the worse for the adventure.

Red-winged blackbirds are particularly attractive to children. It is easy to observe them sitting on cattails in swamps or flying about other low places. Sometimes they join the rusty blackbirds and grackles and are quite conspicuous with their fancy shoulders among the large flock of soberly clothed companions. If the children wish to study the red-winged blackbird, they can see him eating¹⁵ weed seeds, locusts, and now and then some wheat. They may verify their observations by a book or bulletin on the food habits of birds.

Journeys to study birds would not be complete without a number of observations of the robin. He is one of the signs of spring for which children usually watch and appears very grateful for any food that is given him. If there are bird-feeders in the schoolyard there is no need for class excursions to study robins. Any child who wants some first-hand facts for a story or

¹⁴ Shankland, Frank N. *The bird book*. Akron, Ohio, Saalfeld publishing company, 1936. p. 2.

¹⁵ Henderson, Junius. *The practical value of birds*. New York, The Macmillan company, 1934. p. 233.

a few moments' entertainment can put out some food and remain quietly watching. The robins will find it. They like people and they like all domestic animals. If the neighbor's chickens find the food, the robins do not mind sharing, and they exact more than their due if they in turn find the chicken's food in the barnyard. City children as well as country children have many opportunities to observe robins and sometimes city children love them and appreciate them more than country children. Robins become very angry if their nests or their little ones are disturbed or injured. One observer¹⁶ climbed a tree to look at some robin's eggs one day and received a sound scolding. This slight molestation was never forgotten or forgiven and every time the observer went out of the house the female robin would fly straight at his head, only swerving aside when within 6 feet of him.

Children who are interested in reading about birds in bulletins, books, and magazines will wish to take trips to observe the birds and decide how true are the facts they read. Children who observe birds first may wish to read widely to learn more about them.¹⁷

City parks have many birds, from early spring till after migration in the fall. Birds select the park as one of the places where they will not be molested, and often there are more birds in a park than in a grove on a farm. Very rare birds when migrating often stop for rest in a park, and the nature excursionist can sometimes see birds that ordinarily do not live or even stop in his neighborhood regularly. Through observations alone, if carried on from year to year, a child can become familiar with the birds which are regular residents, and those which stop for a short time on their way north or south.

Children who love birds can undertake different special studies to discover the relation between the bird's form and the environment he chooses for himself. For example, snipes have long bills with which they can bore deep into the earth for worms. Woodpeckers have strong sharp bills which are useful in digging insects out of the bark as well as for cutting holes for nests. They are the "tree doctors" of the bird world. At least half of the spruce-bark

¹⁶ Shankland, Frank N. Op. cit.

¹⁷ Sources of information are listed in United States Department of the Interior, Office of Education, Good Reference Bibliography, no. 72. Leaflets of information with colored plates and the magazine, *Birdlore*, useful for study and observation of different birds, can be secured from the National Association of Audubon Societies, 1775 Broadway, New York, N. Y.

beetles of the northeastern United States are said to be eaten by woodpeckers.¹⁸ Birds have feet which are shaped according to their needs and environment. A study of birds' feet to learn about their lives has been compared to the palmist's study of hands in his efforts to tell something about the life of a human being.¹⁹ Birds "clothing" is adapted to their needs more adroitly than their human admirers; birds of the South are more scantily clad, than those farther north; some shed their feathers in summer and grow them again for winter. Color plays an important part in birds' clothes. The meadow lark has a gray brown back like the earth where he hunts his food, with plenty of yellow, black, and white to harmonize with the color of the flowers and sunshine in the landscape. Birds have a conventional wardrobe and they never change its style. It has emerged through long ages of struggle to keep alive. Of what advantage are their colors? How do the brightly colored birds, such as the tanager, protect themselves? These are interesting questions for study following an excursion to identify birds.

It requires time and patience to learn about birds through observation. It is best for children to take their trips in small groups or alone. They should keep records, sketches, and photographs to study. Through discussion, suggestions for reading, and aid in planning excursions the teacher helps. She accompanies class or school groups on excursions, but many trips will be made evenings, mornings, and Saturdays by individuals and small groups unaccompanied by the teacher.

Search for Materials

Sometimes children need an excursion to find materials for experiments. Environments differ. City children who experiment with erosion of different kinds of soil will find it necessary to visit a vacant lot, an excavation for a new building, or a garden or a field in the suburbs to secure a varied collection of samples of soil. They may go in small groups or individually. Samples of soil can be brought to the schoolroom and used for planting seeds in different ways, for modeling various forms of erosion, or for window gardens.

¹⁸ Henderson, Junius. *Op. cit.*, p. 209.

¹⁹ Compton's Pictured Encyclopedia. Chicago, F. E. Compton & Company, 1936.

The children may wish to observe growth made by plants in different kinds of soil. They can do this by gathering specimens of soil in which to plant corn, wheat, or beans in the classroom. They may profit more by planning original ways of measuring plant growth or making other tests than by following the experiments outlined by the teacher or by the text. In addition to planning ways to measure amount of plant growth, children can plan ways, either indoors or out of doors, to help them decide which kind of soil loses its water most quickly by evaporation, which kind holds its moisture for the longest time, and which kind produces healthiest plants.

Specimens of shrubs, plants, and grasses used in the prevention of soil erosion and in the renewing of soil can be collected, pressed, and labeled. Some pupils will be interested in collecting close-growing plants, such as wheat or oats, and comparing them with plants like corn, tobacco, and cotton which are cultivated in open rows. Others will wish to collect vines, trees, shrubs, and grass which are useful in filling gullies, or various kinds of legumes used in rotating crops.

Children who are studying minerals can secure specimens at a quarry, a mine, along the road, or seashore. There are often rocks of different kinds in old excavations. Children who are collecting minerals and rocks at home will find it interesting to visit collections, and may take specimens to a museum for identification. Collections of rocks and minerals for identification purposes are sometimes loaned by State departments of conservation or education.

Excursions are often necessary for the collecting of flowers and leaves to press for identification in later studies. The first excursion for this purpose should be taken by the group as a whole and the teacher, in order that the children learn not to gather more specimens than necessary, not to dig rare plants, and to leave sufficient plants for propagation in the spot where they gather those to transplant.

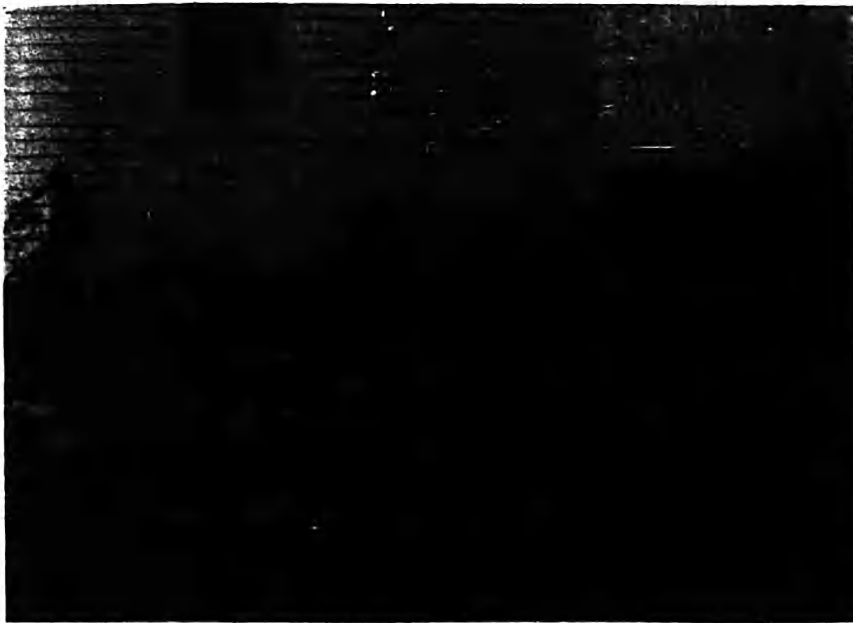
Birds' nests are sometimes collected for study. They should never be collected in nesting season, and frequently students of birds advise against their collection by school children, because some birds, such as robins, use the same nests from year to year, and others use the discarded nests of different birds. Birds' nests should not be collected except for serious and profitable study, and when collected they should be well preserved. Collec-

tions of weed seeds which birds are observed to eat are helpful to supplement a study of the food birds eat.

Improvement of Conservation Activities

Conservation activities often require excursions for their consummation. Children who have established a nature trail, for example, must visit it to keep it in order. Other examples are given in the following pages in connection with wild flowers, local history and culture, plants and animals, and soil.

Protection of wild flowers.—If a group of pupils undertakes to label trees or wild flowers, it is necessary first to survey the community



Transplanting wild flowers affords opportunity for study.

to select flowers or trees which are to be named. In labeling wild flowers along roadsides or in other conspicuous places it may be necessary to make excursions at different times of the year in order to place labels correctly when different flowers are in blossom.

Interesting excursions can be planned to develop a wild-flower garden on the schoolground. An important consideration is the nature of the soil which should be similar to that in which the flowers grow naturally. Hardy wild flowers will grow in soils of varying types, but delicate wild flowers are definitely affected by the nature of the soil. This can be determined by tests which children can make. Books on agriculture and science give simple

instructions for testing soils for acidity and alkalinity. When it is impracticable to make the tests, samples of soil can be sent to the State agricultural station for testing. Soils where wild flowers grow can be compared with the soil of the schoolground, and plants can be chosen to which the soil is adapted. Or the school garden can be prepared with soil of the nature required by the flowers desired. This preparation of soil is especially desirable when rare and sensitive wild flowers are to be transplanted.

Among the common wild flowers that are indifferent in regard to soil acidity ²¹ are the following:

Common Blue Violet, blossoming from April through June, which is easily transplanted and established either in shade or sun.

Butterfly Weed, blooming through June and September, which stands transplanting well and requires no special care.

Blue Vervain, a very decorative, deep purple plant, also easy to establish anywhere, blooming from July through September.

Iron Weed, a madder purple plant, excellent for grouping with sunflowers on the borders of meadows, and blooming in August and September.

Joe-Pye-Weed, a lavender pink flower, common along swamps and in other low moist ground, and blooming in August and September.

Black-Eyed-Susan, easy to plant and very desirable in wild plantings, blooming from June through August.

Ten Petaled Sunflower, common on wooded slopes and easy to cultivate in dry soil, blossoming in August and September.

Among the common wild flowers that thrive best in "circum-neutral" soils are the following:

Jack in the Pulpit, growing usually from April to July, yellowish green with brownish purple stripes, red berries, fond of moisture and easily grown from seed.

Dutchman's Breeches, white, yellow-tipped, blossoming in April and May, and easy to transplant.

Early Meadow Parsnip, blossoming in May and June, pale yellow in color, and easy to transplant in similar situations.

Fringed Gentian, sky blue in color, blossoming in September and October, and can be propagated only from seed which should be sown soon after gathering in moist, rich, and sandy soil, with light mulch, dead leaves, or grass for protection during winter.

²¹ Durand, Herbert. Wild flowers and ferns: In their homes and in our gardens. New York, G. P. Putnam's Sons, 1925. p. 120-155.

New England Aster, in color, lavender to deep purple, blossoming from August to October, and easily transplanted.

Among the common wild flowers that thrive best in moderately acid soils are the following:²²

Early Buttercup, deep yellow in color, blossoming late in April through May, found on wooded hillsides, and suitable for transplanting in clumps in similar situations.

Bluets or Quaker Ladies, white or tinted blue, blossoming from April to October in moist grassy places, and easy to transplant or to seed.

Showy Aster, blue in color and found only near the coast. Can be transplanted, blossoming through August, September, and October.

Pearly Everlasting, white in color, blossoming from July to September on dry hills and in woods and clearings, and easy to transplant.

Among the wild flowers that require intensely acid or mediacid soil are the following:²³

Dwarf Iris, Moccasin Flower, Trailing Arbutus, and others which the wild-flower gardener is advised to buy for transplanting rather than to dig.

There are other considerations in the development of a wild-flower garden besides the nature of the soil, such as moisture and presence of trees and shrubs. The amount of moisture of the garden on the school ground should be similar to that in which the flowers thrive in their natural environment. Protection from trees and shrubs which rob the flowers of moisture and food is necessary for some plants. By an excursion children can learn whether the flowers they have selected grow best near trees or away from them. When it is impracticable for the entire school to make an excursion necessary to discover the needs of different plants, trips can be taken by committees and individuals and reported to the school.

Any class desiring a wild-flower garden can by group and individual excursions learn the needs of wild flowers in their natural environment, and decide what ones they will have most success in cultivating. A transplanted flower garden should begin experimentally in order to insure suitability of soil with respect to acidity, moisture, and other growing conditions. At best too many transplanted flowers are destroyed by unfavorable conditions.

²² Ibid.



Whether to pick or not to pick is an important decision.

A wild-flower sanctuary can be the object of many school excursions to study wild flowers or gather seeds or plants for transplanting. It can also be a means of preserving species. Any school can take the initiative in the establishment of a sanctuary or can cooperate with a civic organization for the maintenance of one. Mrs. Hugh P. Dearing, of the California Conservation Council, writes:

The dream wild-flower sanctuary that is nearest to our hearts is on the top of Santa Ynez Mountains; a wide strip of land on either side of the road for its entire length. We would have it definitely set aside as a wildlife preserve and public park, administered by a park superintendent who understands the needs of our wild flowers and is in sympathy with the people who love them. We would not introduce a plant not native to the region. There would be places where poppies and lupine and tidy tips could be grown abundantly; where children might go under supervision to study, or pick a few

flowers, or gather seeds for their own home gardens. Places for camping and cooking could be provided in a few places under the Coulter pines, or oaks or bay trees, and many places provided for parking. It should be possible for students to get permits to collect specimens for study.

All the unsightly banks would be clothed with dicentra, tree poppy, lavender solanum, prickly gilia, climbing pentstemon, lotus, wooly blue curls, four kinds of wild lilac, four kinds of mariposas, and Indian paint brush, Indian warriors, pitcher sage, wild peonies, and Chinese houses. There are more than 200 species of wild flowers in that region that would if given a chance paint those hillsides into one of the most beautiful parks in the world.

Positive signs in sanctuaries and wild-flower trails are more effective than negative signs. Much planning and study, many excursions, frequent experimentation with wood, metals, and paints, on the part of the children are necessary for the construction of useful, instructive, and durable labels and signs. For example, in the Palisade Interstate Park near its Bear Mountain headquarters, where a series of nature trails is maintained, a map of the mountain²² was placed at the beginning of the path with the sign:

THIS TRAIL WAS BUILT FOR YOU

Farther along the trail were other signs. A hemlock tree bore these words: "The only local Evergreens that bear small cones upon the tips of the twigs are the Hemlocks." "Remember that others will enjoy seeing this Mountain Laurel."

Activities with plants and animals.—Children who are interested in the conservation of wild plant and animal life should survey their community to determine what kind of conservation activities are needed most. In some schools different grades or classes may make surveys. In one-room schools committees of pupils with special interests in certain types of conservation can be appointed. Information can be gathered for different types of activities such as the establishment of bird and animal feeding stations for winter or nesting time; the labeling of plants and interesting scenes on nature trails or in a community woods, forest, or park; the posting of information about certain wild animals; the planting of trees and shrubs in gullies; the proper gathering

²² Carr, William H. Signs along the trail. New York, The American museum of natural history, 1930. p. 11.

of plants for wild-flower gardens. For example, a certain handicraft club in South Dakota reports plans for a waterfowl refuge. According to the plans, the dam to be the basis of this refuge was to be fenced and trees and water grass and plants provided as food and cover for waterfowl. Further plans were made to stock the dam with fish, and to post signs to prevent fishing and hunting out of season.²⁵ Many trips were taken to develop the plans, and something new was learned on each trip. At the time the report was made,²⁶ the refuge had not been completed.

Children who are participating in the maintenance of a nature trail can take trips to study the haunts of birds and animals near the trail and construct signs for the benefit of visitors. For example, at points along the trail mentioned²⁷ were pictures of birds and signs such as these: "This is a Catbird whose last year's nest is still here" and "Here is the Ovenbird feeding its young." On this trail a few turtles, harmless snakes, frogs, and toads were confined in cages which bore labels such as, "It is true that snakes 'play dead' as a means of protection" and "It is not true that snakes are able to charm birds and people." Near an ant hill was a revolving sign bearing items such as "An Ant Queen started this hill about ten years ago."

Building nesting places for birds is a protective activity which has long been of interest to children. Children can learn much regarding the kinds of homes²⁸ which birds prefer by excursions to observe the natural location of bird nests, the way they are built, and the ways in which they are used. If books are available, excursions can be supplemented by pictures²⁹ of correctly built bird houses and by printed suggestions for building them.

Continued observation is necessary for the satisfactory completion of certain activities such as the establishment of suitable feeding stations for birds. Children in small groups can observe and keep records from day to day. In building feeding stations to attract winter birds, it is well to learn the kind of food different birds like best. Favorite foods are bread crumbs, seed, suet, fruit, scraps of vegetables, and meat. Situations for feeding stations vary. For example, some of the more timid birds like high

²⁵ Hanna, Paul R., *and research staff*. *Youth serves the community*. New York, D. Appleton-Century Co., Inc., 1936. p. 221.

²⁶ *Ibid.*

²⁷ Carr, William H. *Op. cit.*

²⁸ *Compton's Pictured Encyclopedia*. *Op. cit.*

stations, while the more aggressive types such as starlings and English sparrows prefer to take their food from the ground. When starlings rob the chickadees, the children can sometimes remedy the situation by scattering plenty of grain for the former on the ground, and feeding the latter on a higher platform or shelter.

The best time to feed birds is late in winter when the natural food supply approaches exhaustion. When feeding is begun it should continue as long as scarcity prevails. When observing birds at food stations, pupils should move quietly. Quick movements and sudden noises startle the birds and make observance difficult. Food, nesting boxes, and drinking fountains should be placed where cats and other enemies cannot reach them.

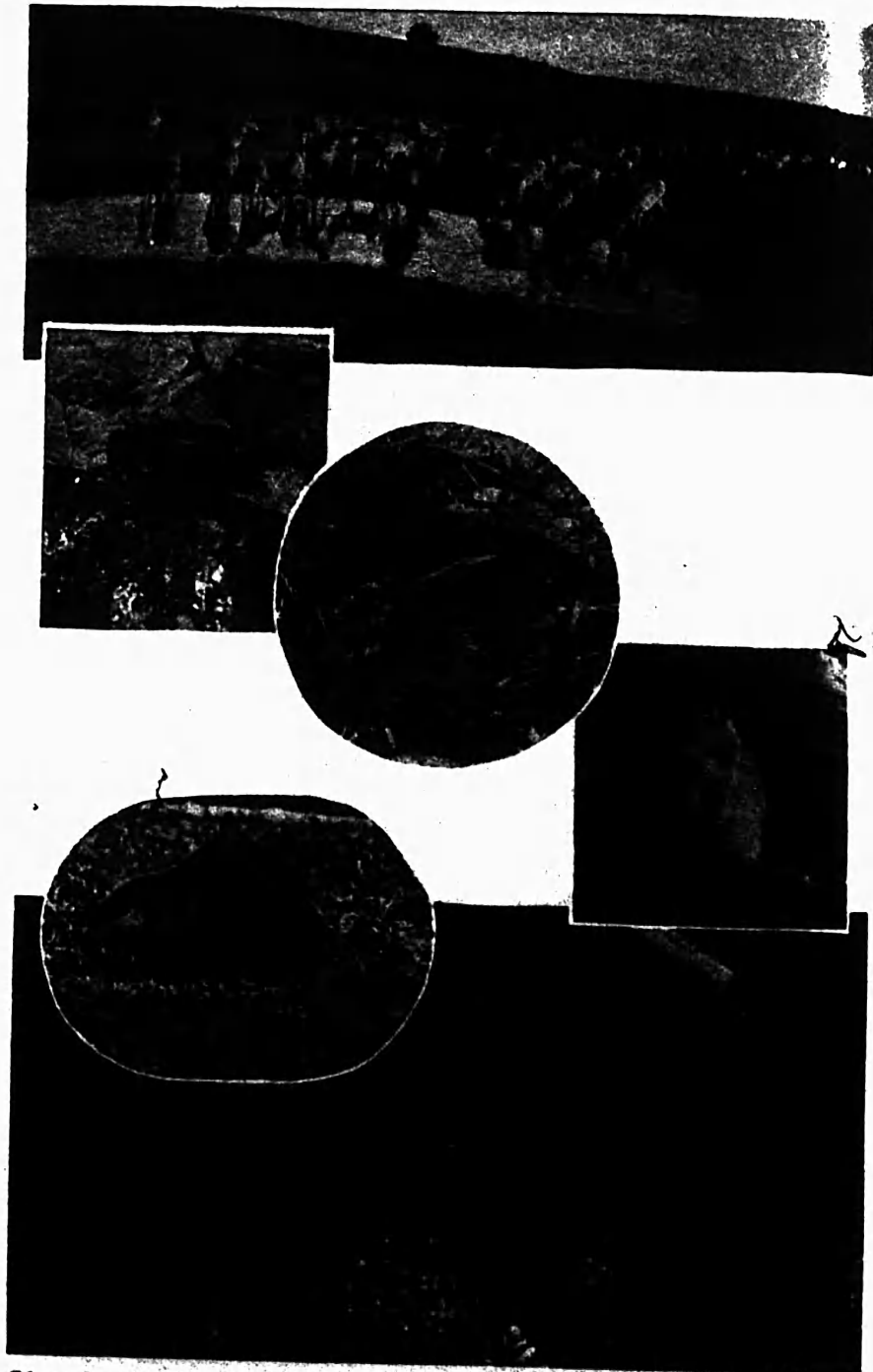
Children need trips to decide what kind of shelter to provide for birds and animals. In the country, shelters can be arranged in shrubbery. In schoolgrounds in towns and cities, shelters should be erected. Glass is sometimes better than wood, because it enables observers to have a good view of the birds.

Children who are interested in the care of trees can learn when the trees of their town or city street, or father's farm are to be treated by a "tree doctor," and plan an excursion to observe the work. They should inquire about the material which is used to fill cavities caused by decay, as well as see how the work is done. Large limbs of trees are often supported by rods to prevent their splitting away from the main trunk. Such activities can only be performed by the expert.³⁰ Children in upper grades, however, can examine the trees on the schoolground and in their home yards for signs of bruises in the bark. With a sharp knife they can cut away loose and injured bark and paint the area with "refined gas tar."³¹

The establishment of a school forest is a helpful activity because it serves as recreation for adults and children. Children can do much of the planting. Before beginning, they should observe other school forests, study the land to be replanted, map it for further study and planning, and learn of the trees and plants which grow best there. Many trips should be taken by the class, by individuals, and by committees. Two high schools in Seattle, Wash., secured from the Federal Government areas of deforested

³⁰ Moseley, Edwin L. *Trees, stars, and birds. A book of outdoor science.* Yonkers-on-Hudson, N. Y., World Book company, 1935. p. 141-43.

³¹ *Ibid.*, p. 143.



Observing habits of wild life: (1) Antelope refuge, Nevada. (2) Yellow-legged frog in native habitat; Yosemite National Park. (3) "Bunny." (4) Ground squirrel. (5) Beaver. (6) The work of beavers.

land not far away from the city. The students planned programs of planting and other improvement from year to year and made trips to the forests. There they worked, slept in the open, ate,

and played. The plantings are kept in good order through frequent excursions.

A field trip to observe tracks in the snow intrigues children, and pupils who are interested can arrange signs in a woods or grove to help their classmates study haunts and tracks of animals. A light fine snow is best to observe tracks. Observation of the tracks of birds can be a lead to a study of the way birds' feet are adapted to the environment.³²

In the smooth soft mud near creeks, especially after a rain has deposited new layers of silt, pupils who are interested will find squirrel, chickadee, and quail tracks. Trips for information should be utilized for conservation activities. Should the animals studied be protected? Do their habits suggest ways of protecting them?

Activities in connection with soil erosion.—Many excursions are necessary in connection with activities for the purpose of preventing soil erosion. In a country school where the pupils are filling gullies a trip can be taken to study gullies in neighboring fields. Sometimes several trips will be necessary. The children should seek the cause of the gullies they visit, such as erosion on the hillside, the continuous dripping or washing of water, as from the eaves of a barn or the overflow from a watering tank or an unprotected roadway grading. They can study the speed of the erosion and map the gully before and after severe rains. They will observe the extension of the gully into neighboring fields. If methods of controlling gullies are practiced in the neighborhood, the children can study them, observing how types of control vary with the nature of the erosion.

A study of gullies and the methods of controlling them is most important if made for the purpose of planting shrubs or vines, of building dams with stones or logs, or of developing some other type of protection. Many, perhaps all, of the children in the class can take charge of a small gully on their home farm and try to check the erosion. Small ditches should be chosen for the purpose. It is not practical for children to do work by hand which can better be done with teams, tractors, and concrete dams. More excursions will be required as the children make progress in their work. Individual rural pupils can consult their county agent. On

³² A number of suggestions for reading tracks are given in *National Nature News*, 2: 1, 3, January 31, 1938.

Saturdays now and then different pupils can visit a classmate's gully and see what measures he is using and what success he is having. At the invitation of pupils and their parents, the class or school can visit gullies on which pupils are working and advise and consult.

Preparing the school lawn for grass and caring for it properly is another activity in which conservation of soil needs to be considered. Country and small-town schools can plant grass, shrubs, and flowers of many kinds. Trips to neighboring schools engaged in similar work are helpful. Excursions to private lawns, to State highway landscaping, and to nurseries are means of securing practical information to improve activities.

Local history and culture.—An important phase of conservation is that connected with saving and protecting local culture. Many communities have museums, relics, landmarks, and historical buildings which children should learn to appreciate. The excursions afford one means of acquainting pupils with them. Several examples can be cited.²³ The pupils of a New York City high school developed a historical guidebook of early New York scenes connected with the life of Washington. To secure relics and information they visited museums, memorials, libraries, historical societies, parks, and private houses once honored by him. The guidebook was printed and hundreds of copies used by visitors to New York. In another school a class of sixth-grade pupils and their teacher developed a local natural history dealing with the history, geography, flora, and fauna of the locality. Several field trips to the city park were required to gather information for the book. In its development special topics were assigned to individuals, and certain sections prepared by committees. Both individual and group trips were taken.

The older pupils of a New England school,²⁴ made an excursion through New England. In planning, the class studied points of attraction which could be visited on the trip, and each pupil chose a topic which he was to develop according to his own interests. One boy decided to make a study of Paul Revere's ride, another a study of ships, a third investigated the whaling industry. Travel maps were collected and each child's problem for study was located on the map. Some time preceding the journey, an hour a

²³ Hanna, Paul R., and research staff. *Op. cit.*, p. 198-221.

²⁴ Peterson, Axel G. Adventures in real learning. *Progressive Education*, 10: 154-58, March 1933.



Children can arrange exhibits after study of national cultures found in their community.

day was used to study individual problems. When points of general interest such as the home of Hawthorne and the House of Seven Gables arose, they were listed for attention of the entire class on the journey.

Interviews

Classes and committees sometimes take trips to interview individuals who are experts in different fields of conservation. For example, a study of soil conservation and activities in the conservation of soil can be enriched by interviews with farmers and soil experts such as the county agent. A farmer who has successfully controlled erosion on his farm can be of great help to a class. The pupils and teachers plan questions in advance; others will arise during the interview. It will be helpful to ask what success he has had in rotating pastures to improve the condition of the grass and prevent washing of the soil; what precautions he observes in contour ridging of pastures, what he considers the most useful type of gully control on his farm and why, what kinds of trees and shrubs he plants in his gullies and why, what he is doing to prevent sheet erosion. The class can learn whether he has a windbreak of trees and ask him to discuss its values and uses.

Elementary school pupils are usually eager to visit a Civilian Conservation Corps camp and talk with the boys and the leaders. Occasionally individual children secure information to report to those unable to take the trip or become acquainted with boys whom they might interview. The Future Farmers of America and 4-H Clubs are also organizations which can be very helpful to elementary school pupils studying conservation.

Children who are making maps of their community to show soil erosion, kind of conservation practiced on different farms, etc., can take their maps to a soil specialist for constructive criticism and assistance. They can examine conservation maps of the community, get information on reduction of certain crops and increase of desirable ones, discuss ideas for wise use of land in the community and probable opportunities for young people in the county, in farming, gardening, or in other lines of work.

Children who desire to plant trees on their school ground can interview a city nurseryman to learn what kinds are suitable for the soil and climate. A gardener will discuss types of soil and the needs of certain plants.

PREPARATION

The Teacher's Plans

Excursions, like other school activities, frequently are profitable and pleasurable in proportion to the teacher's planning. This planning consists in familiarizing herself with the environment to be visited, reading and study with the excursion in mind, consideration of the results that can be achieved, and arrangements for transportation, emergencies, and the like.

Preliminary visits.—A preliminary visit to survey the educative possibilities of the trip is essential. If the teacher contemplates an excursion for the study of birds, for example, she will try to discover what birds the children will be able to see and hear, using a bird guide to help in identification. She will study the shrubbery, trees, and streams, and decide upon vantage points for observation. From a certain thicket, for example, it may be easy for the class to observe a pair of bee birds,³⁵ or meadowlarks, note the kind of food they eat, the way they build their nest or care for their young. She will decide what spots are best for feeding stations and whether the birds have sufficient natural shelter for the winter or need a shelter built by the pupils, and be ready with suggestions to help the pupils make the most of their excursion.

When planning an excursion to study soil erosion the teacher should first get the cooperation of a farmer by meeting him, finding out about his methods of cultivation, and the care of the land by preceding owners, and by learning other facts helpful in understanding methods of control practiced. Attention should be given to such minor details as the location of gates and drive-ways through which children will pass on their way to the fields. If a trip to a managed forest is to be taken, the teacher should first visit the forest ranger or a regional forest supervisor and discuss with him the proposed journey. Preliminary surveys should be supplemented by such books as are available to the pupils, as well as by authoritative adult books. If her class or school desires a wild-flower garden, she must plan with the

³⁵ Pollock, Adelaide L. Excursions about birdland from the Rockies to the Pacific. Seattle, Wash., Independent Commercial Printers, inc., 1925. 191p., illus.

utmost care. Her plans should not supplant the children's planning. Pupils should plan to select plants to suit the soil, or to test the soil and supply foods required. However, the teacher cannot help them plan without first having planned herself. Before the pupils begin such work, the teacher must know how the soil can be labeled for sending to the State agricultural station and must know where to send it. She must know what flowers can be transplanted in the soil of the school ground as it is, and, if she decides to have the children experiment by trying different plants, she should know where these can be secured without spoiling beautiful patches in the woods or destroying rare flowers.

Reading and study.—Reading and study are necessary in order that the teacher may help the pupils interpret what they observe. For example, in a study of birds she should be able to identify the birds in which the children will be interested, know where to look for them, understand their nesting habits, know what food they eat. The teacher who must depend upon the information secured from an occasional passer-by to identify a bird for her class is not sufficiently well informed or prepared to lead her pupils on an excursion to observe birds. Before an excursion to a farm, the teacher should be prepared to point out different types of soil, of erosion, and methods of control for the children's consideration and observation. She should understand why soil varies in color in different parts of the same farm, how a balance of nature is achieved in different instances, and other significant items, not for the purpose of telling it to the children, but rather that she may bring up questions which the pupils will need to consider. If the teacher knows that the excursion will show that farmers burn off woods or fields, she should know why, as well as whether or not it is a good practice. If the class will see rich, dark bottom land, the teacher should know how it was formed, why it is so rich, why the plants that grow there are usually healthy. Perhaps the farmer practices crop rotation. This is a subject with which the teacher must be familiar before the journey is taken, even though the pupils will need to follow it up with study after the excursion.

Planning a trip to study flowers or perhaps to secure wild plants for transplanting is another example of the teacher's need for research. Having made a preliminary visit to the field, woods, or park, where she will take the pupils, she must be sure that she

can identify the flowers. There are books to help her learn which flowers can be transplanted, and at what time of year. For any phase of conservation the more reading the teacher can do, the better.

The pupils must have direction in their search for answers to their questions. For example, there may be helpful facts in the fields, in the type of rock which appears to be the base of the soil, the amount of vegetation which built it, and the average amount of annual moisture; with the teacher's guidance the pupils will find these facts. It is best for the teacher to know before the excursion what books will help answer the children's questions and what facts are given. Many questions will arise to which she does not know the answers and she will study with the children. Annotated bibliographies will be helpful in the selection of background material.³⁶

Consideration of desirable results.—Few scientific studies have been made of results of excursions in any field. The conservation excursion is particularly new in the experience of teachers and of educators, and no one can make specific scientific statements regarding its outcomes. However, there are indications that such excursions are especially valuable. For example, *the social implications of conservation often can be understood through journeys* better than through books. For some subjects much of the information needed is in books or is the kind of knowledge which teachers pass on in lectures, undesirable as such practice is considered, and the need of an excursion to gather it is not urgent. In conservation, on the other hand, much of the factual knowledge which children need for drawing conclusions is outside the classroom. An excursion is needed to seek it. Reading and study cannot compare with the excursion in factual results in a study of birds, for example. The same can be said of flowers or of any other natural resource.

³⁶ United States Department of the Interior, Office of Education. Good references on conservation education in elementary schools. Washington, U. S. Government Printing Office, 1938. (Bibliography No. 70.)

Good references on conservation of trees and forests for use in elementary schools. Washington, U. S. Government Printing Office, 1938. (Bibliography No. 71.)

Good references on conservation of birds, animals, and wild flowers for use in elementary schools. Washington, U. S. Government Printing Office, 1938. (Bibliography No. 72.)

Learning is less effective when children lack a chance to engage in normal activities and form habits and attitudes. Reading about flowers that are too rare to be plucked, watching the effects of humus on plants in the window gardens of the schoolroom, seeing the devastating effects of the water erosion in pictures in the school geography do not produce conservationists. The pupils become familiar with facts but have no habits of performance. Conservation excursions lead children to take part intelligently in the protection of natural resources.

Like any other excursion,³⁷ the *conservation excursion enriches the children's experiences*. In the schoolroom a class can read about or listen to a phonograph record of the songs of birds and see them reproduced by notes on paper. These things are interesting and have values, but the results cannot equal those from hearing the bird sing or trying to find where he sits as he sings and watching his flight or his pose.

The conservation excursion *under guidance of the teacher or the expert* gives a topic more meaning. To the child without guidance, a field planted in strips of corn and beans or wheat means little more than the kinds of crops chosen, the arrangement of the strips, the condition of the soil. After an excursion, however, with the questions the teacher has suggested, the difficulties he observes, the farmer's discussion, he returns to further study and plans trips to other farms on which different attempts are made to control erosion, continuously gaining new ideas and making comparisons and generalizations.

Certain *conservation journeys contribute to the building of attitudes and appreciation as well as to knowledge*. A child can read about ferns and marvel at the grace of their fronds as shown in pictures. But take him to a fern hollow in the woods, let him find one or two that he can identify among six or eight that are just ferns to him, and he asks questions, turns to his key with eagerness, and becomes so fascinated that he goes again and again to the spot as one listens again and again to the same opera. The experience is further enriched if the teacher will help him note location of spores and the shape and color of fronds, so that he knows each fern without looking it up the next time he goes to the hollow; or if she calls his attention to the nature of the loca-

³⁷ Price, Reuben H. A study of the values of field trips. In *Thirteenth Yearbook, Department of Elementary School Principals, National Education Association*. Washington, The association, 1934. p. 304.

tion, whether wooded, rocky, of acid or alkaline soil, and the like, so that he knows where to look for the same kind of ferns on different excursions. No amount of study and lecture on conservation can produce the impression that a journey does to see fish killed by pollution of water in streams, the effect of a lake gradually filling by silt eroded from surrounding hills, a gully that has spread to a house or a highway and threatens complete destruction.

If, in a contemplated journey, the teacher cannot anticipate the achievement of some of the foregoing results, that journey probably is not the type of activity which her pupils need at the time. It may be better for them to become engaged in an activity on the schoolground, such as the filling of a gully; the planting of trees, flowers, or grass; the protection of birds. In such undertakings the children will later need the information and understanding to be secured by an excursion, and taken at this later and more opportune time, the journey will result in some of the desired achievements.

Alternate plans for emergencies.—When arrangements are made for an excursion, it is well to have some other activity planned in case the excursion becomes impossible. If a rain spoils a trip to the woods, country children can substitute a study of machinery in a farmer's shed, from the standpoints of its use in erosion control, of the amount of iron used in its manufacture, and of ways of protecting it. If, on the morning chosen to observe birds, they do not appear, the journey can be a success if the teacher has planned a study of flowers, plants, trees, or soil. In the city, if an intended trip to an aquarium to study fish becomes impossible for any reason, an alternative excursion to observe fish in the aquariums of stores will be useful if it has been arranged tentatively. Likewise, a tentatively planned journey to a museum to study birds can be substituted for changed plans to take the children to an aviary in the park.

Guidance.—Frequently children need more assistance than the teacher can give in making the most of a field trip. Expert guidance may be helpful. Sometimes it is possible to hire a guide for projects with which the teacher is not familiar. At other times free service is available. In a trip to a farm, for example, the farm owner may take the leadership in explaining to the children the activities to be observed. City pupils visiting a nursery for information to help develop a schoolground planting can secure it

from the manager. In museums, guides are frequently provided for school groups without cost to the school. In the museum excursion it is well for the teacher and the children as a single group quietly to follow the guide, stopping for discussions and questions when desirable. Other possible guides for conservation excursions are a county agricultural agent, a group of Future Farmers of America, the educational adviser of a Civilian Conservation Corps camp, or a representative of some private or governmental conservation agency, such as the National Park Service, the Bureau of Reclamation, or the Soil Conservation Service. Children and teachers should keep in mind the fact that it is not always easy for anyone to have at the tip of his tongue sufficient information to answer the questions of a group of young students. They should appreciate the information they receive and do all in their power to reciprocate.

When the teacher is guide she should conduct the party, not as a director but as one of its members who has taken the trip and is familiar with points of interest. Except when the children are called together for discussion or explanation, they should proceed as an informal group, following individual interests, or moving about in committees responsible for a report to the class on certain objects in the excursion.

Plans for transportation.—When transporting by bus or car is contemplated, school board or teacher may need some type of liability protection from possible accidents. Some boards arrange for blanket permissions from parents covering excursions made throughout the year. Other boards arrange blank forms to be signed by the parent for each separate trip absolving the board from liability. Whatever the arrangements, the school board and the teacher should secure the safest driver available and take all possible precautions against casualties.

When automobiles are borrowed for transportation, parents may be willing to drive the cars. There is no reason why a parent should not transport pupils if he carries adequate insurance, has a good car, can drive well, and if the route to be traveled is comparatively free from the dangers of congested traffic. In a city when a teacher has charge of a large group, especially of younger children, it is often helpful for some of the mothers to accompany the group. There are teachers, however, who like to be alone with their pupils and feel that the children receive more from the trip when responsible to the teacher only.

When transportation of older pupils is made in school busses, there should be provision for an adult to have charge of the children's entertainment and discussion in each bus. It is impossible for a driver to transport the children in safety if he must be responsible for their conduct as well as for driving. Pupils can plan their time on the journey. Several road maps should be secured. On these they can trace the route traveled. Each pupil can sketch a pictorial map of interesting things to be seen along the way, leaving space to sketch on the journey those objects which were unknown to the class before the trip.

When large groups of country children visit a city, special care should be taken that no child is lost. Different procedures have been followed. One teacher asked her pupils to organize in small groups with leaders. At each break in the journey, such as taking crowded elevators to different floors of a large building, the leaders "rounded up" the pupils belonging in their group. If any leader was unable to locate all the members of his small group, he reported to the teacher and the class waited in one place until the "lost" pupil was found.

For long journeys special precautions must be taken in order to have pure milk and water for the children to drink. Good food is equally desirable. Sometimes each child can bring a lunch from home for the first day. For other meals the teacher should investigate eating places in advance.

Class Plans

The more actively pupils can be drawn into the planning of an excursion, the more educative will the trip be. Teacher and pupils together should plan and organize the activities connected with a proposed excursion, appoint necessary committees, consider expenses, decide upon specimens to be gathered, make arrangements for equipment for the journey, anticipate the type of conduct to be desired on the part of individuals and of the group, and arrange for expert guidance when desirable.

Planning and organizing activities.—One of the most important factors in a successful trip is organization.³³ The questions to be answered on the trip should be organized to accord with some definite purpose; the class should be so organized that individ-

³³ Lobeck, Armin K. The organization of field excursions. In Thirteenth Yearbook, Department of Elementary School Principals, National Education Association. Washington, The Association. 1934. p. 274.

uals or committees have definite tasks to perform and specific responsibilities with respect to the success of the excursion. All activities should be organized in order that they may receive the emphasis they deserve on the journey. The secret of successful organization is careful planning. Usually details can well be decided and arranged by pupils and teacher in conference—transportation, luncheon, permission from parents, invitation from farm owners, types of clothing, pure drinking water, equipment. Plans vary with respect to the nature of the excursion, the time that can be spared for it, its place in the major enterprise to which it is related, the age and ability of the pupils, the interests of the group, and the amount of money to be spent.

Excursions to gather specimens of soil or minerals or to select wild flowers for a garden, and the like, require a special type of organization, and plans must be talked over in conference and standards set up before the journey. For example, an excursion to gather specimens of soil is interesting if it is convenient and safe for the class to break into small committees to study different sections of a farm. An excursion to study erosion just after a rainstorm requires a different organization. Perhaps the entire class wish to remain out but a short time, visiting only such gullies, eroded fields, contour furrowing, or terraces as can be reached quickly.

The time to be given to a journey will determine the type of planning necessary. If it requires a day, or several days, it is expedient only if the information sought is rich and can be used widely. If the facts to be gained are limited, as in a trip to observe a terrace under construction or a concrete check dam built in a gully, the journey will require little time and can be planned on the day on which the work is to be done. The teacher and children can plan in conference what they wish to learn by the journey, writing questions to be answered and deciding what must be done. For example, they can discuss arrangements for transportation, plans for visiting the farmer to learn when he will do the work which they wish to observe.

Saturday trips can be taken by individuals. They can select places or subjects in which they are interested and report to the class the next week. Sometimes it is possible for the entire class to meet and take a trip, such as to a museum or a park. It is well to minimize the number of class trips on Saturdays, however, lest they take time the teacher needs for relaxation.

Overnight excursions and excursions of several days' duration are more complicated. If they can be made by individuals, such as a trip to grandfather's farm to study erosion control, or to a country cousin to study a wild-flower garden or to secure plants for a school window box, the trouble is minimized. Individuals can report to the class. The class can suggest the things which they wish to know about the methods of erosion control or the wild-flower garden.

If, however, the entire class is to be away overnight, the problem of planning is different. Such excursions must be anticipated in advance, in order that the school work can be directed toward the excursion and the greatest possible use thereby made of it. For example, a class in a southeastern State planned a trip to Washington, D. C. One of the things that fascinated them about the trip was the significance of historical landmarks. All during the year they directed their study toward the Lincoln Memorial, Washington Monument, and buildings of historical import. Washington, they learned, the National Capital, is the seat of the Federal Government. Accordingly, many studies of Government were made. By reading, the pupils became conversant with various Government activities. When their plans for the trip materialized, they were ready to learn much. An extended trip of this kind requires detailed planning. Food is an example. The class decided to carry with them the first day's food. Although they took only the simplest foods, there were many arithmetic problems involved in planning and buying it.

Conservation journeys, like other excursions, must be planned to contribute to the development of the major study or enterprise in which the children and teacher are engaged. Excursions taken before a major study or unit is begun serve as stimulation for further activities and sometimes for the organization of the unit to provide for individual interests. Frequently, however, children do not think about taking an excursion until a unit of study has been introduced and they have become interested. When they need information and fail to find it in the books they are using, they think of the excursion, or the teacher suggests it. Perhaps the need for information is felt only gradually, and questions must be reserved until a convenient time for the trip.

Sometimes excursions are taken on the invitation of agencies in the community such as the Future Farmers of America, the Civilian Conservation Corps camp, or the 4-H Clubs, who have heard

of the children's interest in their activities. When such invitations come, it is well to utilize the opportunity.

* On certain types of journeys such as a visit to a nature trail, individual pupils will study different plants or other items, coming together in groups only to observe points of interest to the entire class. Plans for this should be made in a class conference before the trip. Otherwise, it is difficult to bring the group together and even children who are seeking definite information are diverted by the variety of interesting objects encountered as soon as the journey begins. It is possible to anticipate things to be seen. If these are discussed and a note made of them, the teacher or any child can call the group together when they are found.

For example, a class visiting a farmer's field to study methods of erosion control may have as one of its objectives the study of the beginnings of gullies. In many places, such as the ground under the eaves of buildings, at the end of poorly made terraces, or at unprotected natural springs, individuals will find gullies that are just beginning. In other places they may find erosion which can cause gullies if allowed to continue long enough. It is better for the children to find such examples than for the teacher to point them out, and a child as well as a teacher can call the attention of the group to what he has found.

Appointment of committees to reconnoiter and report.—When the teacher has made a preliminary trip over the field of the contemplated journey, it is well to place responsibility for plans on the children, discussing information needed, its possible sources, and places to visit. Perhaps no decision can be made until all the children know more about the possibilities of two or three places. In this case, it may be necessary to appoint a committee to visit the places suggested and report on their potential values for the excursion. The committee should report on possible arrangements for transportation, food, difficulty of securing permission to visit, and the like. After that the entire class can choose. There are other activities which can be planned by committees such as the collection of specimens, or of information for which individuals or small groups will be responsible.

Consideration of expenses.—The matter of expenses is often troublesome, especially with respect to trips of more than a day. There are always pupils who cannot afford to go. In some schools the class raises money by bazaars and entertainments, and by individual activities, such as mowing lawns, to defray general and

personal expenses. In others, pupils place their earnings in a common fund which is drawn on for the expenses of all. In this way, no child is branded as unable to pay while many have the valuable experiences of earning their way. Often parents are sufficiently interested to make contributions to the common fund. The type of activity which the children choose for making money should be carefully considered. Children should be taught to give value received for the money they seek. Campaigns such as the selling of lead pencils, shoestrings, certain magazines, and the like, are undesirable when the price for the article is above its actual value.

Working for money is sometimes as objectionable as selling things. The practice of allowing children to go from door to door in the community seeking work is undesirable if carried on without restraint and discrimination. It is possible for a class as a whole through posters or the distribution of announcements to let the community know that the children are available for services such as raking leaves, weeding gardens, mowing lawns, and the like. When such services are given, they should be well performed. Teachers of classes that are interested in such work will be able to keep high the standards of services by visiting now and then the pupils who are engaged in the work.

Another method of raising funds and participating in a conservation activity at the same time is to hold an old paper or scrap-iron sale. Children can obtain this material from their own homes and neighbors. The collection can be assembled at the school and sold to a paper-products firm or a local junk dealer.

Planning for specimens and collections.—The collection of specimens and mementos needs attention in planning. Children going on a journey to select wild flowers for a school garden should study transplanting. A committee can study the community, decide which plants can be transplanted and which grown from seed, and find where the plants are plentiful enough to justify transplanting. With an intelligent reconnoitering committee, there is little danger that flowers will be destroyed in transplanting.

A class planning a journey to collect specimens of rocks and minerals needs a committee to study minerals and find which are common in the locality. After they have reported, the class can take an excursion to see what can be found. The reconnoitering committee might also serve as an identifying committee

because inexperienced pupils will find it difficult to identify specimens without help. Identification of minerals is difficult, however, and probably both class and teacher will find minerals they are unable to identify. In this case, they should take their specimens to a local museum or send them to the State museum or mineralogical society for identification. A display of specimens of minerals cannot be built up of the specimens found on a single journey. It will grow as different pupils, stimulated by the journey, continue to bring in new specimens. Doubtless plans suggested here for committees will in many schools be taken up by the class as a whole.

Children and teacher should plan how collections will be assembled and carried home. Plants collected for wild-flower gardens should be carefully taken up and packed. It is well for the class to make a study of ways of transplanting wild flowers. In taking up a fern for transplanting, for example, the plant selected should not be too large and it should be removed carefully from the soil, its root dipped in water from a forest spring or stream, dried with a piece of moss stripped off a rock nearby, and then covered by a piece of new moss.³⁹ Plants placed closely together in a market basket will remain fresh for hours, some for a few days. The children can plan to carry baskets or boxes in which to bring their specimens home. If the excursion is not carefully planned the pupils are apt to collect their specimens haphazardly, and without anything in which to wrap or carry them will find them unsuitable for transplanting when they return. The same is true in making collections of different kinds of soil or specimens of minerals. If the children have not planned ways to bring their collections home, they will find specimens mixed and will be unable to label them intelligently as to location and type of soil or rocky ledge from which they were taken. When specimens are collected, they can be tentatively labeled with respect to source. Tags made or purchased for the purpose should be taken along.

Arrangements for equipment.—Some excursions may require no more equipment than a pocket notebook and pencil. Children who visit a factory to see raw materials made into usable goods will need only their eyes and ears. The same can be said of excursions to see people at work excavating cellars or grading roads. Other conservation excursions yield most educative results when

³⁹ Durand, Herbert. *Op. cit.*, p. 210.

the children are supplied with books for identification of objects, trowels for digging, baskets or pails for exhibits, field glasses, and the like.

A class which takes an excursion to study wild flowers should be well supplied with a half dozen or more flower guides to help identify flowers. This obviates the necessity of taking flowers home withered or dead for identification. It is easier to identify flowers where they grow than in the classroom, because the surroundings and type of soil help. If the book describes the kind of ground in which a particular flower is apt to be found, the children can verify the statement. They can measure the height of the flower and decide whether or not it agrees with the picture given in the identification book. In purchasing identification manuals for flowers and trees, secure simple inexpensive ones with information compactly given.

For a study of birds it is helpful to have a pair of field glasses. However, many valuable observations can be made without glasses. Pupils can observe what food the birds gather and can listen to calls and songs. If they are leisurely and quiet they may hear songs and calls they can imitate. Manuals to help identify the birds will make the excursions profitable. Each bird can be observed and compared with the picture and with the description in the book with a minimum of conversation, which often frightens birds. If the children have no bird guides, they can take notes about the new birds they see—their color, shape when flying or in repose, habits of flight, shape of feet or bill, favorite haunts—and later use an encyclopedia, Government bulletins, or library books to help in identification.

For soil excursions children should be provided with tools for digging, such as garden trowels, which are light to carry and easy to use. A light, narrow spade is useful for digging through topsoil to study the nature of soil and gather soil specimens. An excursion to study soil requires baskets, tough paper bags, or light tin pails in which to carry home samples of soil and rocks.

With plans made as suggested for the safety of the children, and constant alertness on the part of the teacher and pupil leaders selected for the purpose, danger of accident will be reduced to a minimum. However, a first-aid kit should be carried if the group plans to go far from the schoolhouse. An antiseptic and bandages are very convenient in case of cuts from barbed wire, pricks and scratches from thorns and weeds.

Conduct.—Appropriate conduct is necessary to avoid accidents en route, in woods, near streams, on farms. If the teacher and the pupils have worked out a set of precautions, the children are more likely to observe these than if made solely by the teacher. The following are suggestive:

Do not climb through barbed-wire fences except when the teacher or farm owner is there to help or see that no harm occurs.

Do not go near farm machinery when it is in action. Do not climb on farm machinery even though it appears to be stationary.

Do not climb trees on the farm where you visit.

Do not try to board cars unless they are standing perfectly still.

Walk to the left of the road when meeting cars.

Come when called.

Attend to business when appointed to a position of leadership.

Standards of courtesy should be developed. These should apply in homes, on the road or street, on transportation buses, in meeting strangers who answer questions or in other ways perform kindnesses. Teachers frequently report that the politeness of adults toward children impresses them vividly. Children who came several hundred miles to the National Capital were greatly impressed by the courtesy with which they were met at their hotel and in public buildings and were definitely more polite and gentle after they returned home.

Social charm is not the only phase of courtesy that children develop through excursions. Some conservationists have written about outdoor manners—regard for the pleasure of other people as shown by refraining from destroying beautiful patches of wild flowers along the roadside, protecting a nature trail by walking in the path and not along its edge, keeping on the walk and off forbidden plots in parks, woods, or highway parkings. Outdoor manners are not all negative. They consist of such activities as making unsightly places beautiful, of gathering and burning picnic papers and other trash, of erecting notices to aid in preserving outdoor beauty.

In considering the conduct appropriate for any particular journey, teacher and pupils can make a list of the "outdoor manners" which they think will need to be observed on the

excursion plan. Such items as the following⁴⁰ are useful in such a list.

Walk in paths; don't cut across the corners of beautiful grassy plots.

Don't mark on rocks.

Pick up papers dropped by others.

Ask permission before plucking wild flowers on other people's property.

Don't pluck so many flowers in any roadside patch that its beauty is marred for other people.

Obey notices telling how to walk in nature trails.

Obey "no trespassing signs."

Put waste in rubbish cans or keep it until reaching home.

Be quiet when near the congregating places of birds or the haunts of harmless animals such as squirrels.

THE JOURNEY

Concentration on Purpose

Attention should be centered on the object of the excursion. For example, if the excursion is taken to study gullies and the children have decided on things they wish to learn, they will not be too greatly attracted to wind erosion or to signs of washing from steep slopes. However, it is not possible to foresee all the questions or sights that will appear, and the teacher who has led her group to a field to study various types of erosion control, is apt to find some of the children interested in a red-winged blackbird or a clump of spider wort. There are ways of making use of these and similar distractions. Sometimes the group can be called together to observe the "find," questions that cannot be answered immediately can be jotted down for future reference, and then the pupils can pass to the object of their excursion. The interest aroused in the new problems may lead to another excursion, and stimulation for another profitable activity is thus provided.

Discussion

On most excursions it is important for pupils and teacher to discuss what they observe. The teacher usually senses the opportunities for discussions. For example, after a guide has made an extended explanation of some phase of conservation such as

⁴⁰ Worden, Nathalie M., and Perry, Ernestine. *Growing beauty*. Springfield, Mass., National Highway Beautification Council, 1933. 64 pp.

forestry activities of Civilian Conservation Corps boys, the children may need an opportunity to ask questions, report observations made, and discuss the contribution of the things they have learned to the main unit of study. A group that separates to observe collections of mud or silt at different points in a small stream should assemble to discuss what they have seen individually and decide what points, if any, will be valuable for the entire group to observe. A class desiring wild flowers to transplant in a school garden may wish to search through a meadow or in the edge of woods in small groups and report to the class before digging the plants.

If the pupils are not too tired, a short meeting is desirable before going home. Information can be summarized, questions checked to see that none which can be answered on the trip is overlooked, collections checked for completeness, and an inventory of equipment carried along can be taken.

Special Adaptations

Conservation excursions vary in different types of schools and with pupils of different ages, because the types of activities in which the pupils normally engage are different. Probably the greatest differences for which adaptations must be made are differences between country schools and city schools, between young pupils and older pupils, and among individuals within a group.

City children.—For country children excursions are almost a matter of course in the study of conservation. In many cases in the country frequent half hours spent in observing birds or studying trees and flowers afford worth-while results in the way of understanding the need for conservation. But what of the city child? He has no grassy schoolground with trees and birds for study. For a wholesome life his principal needs in the way of nature environment have been stated as follows: ⁴¹

A house with some ground of its own, with a tree for shade, and a space where there might be a garden. Within easy distance open fields to which the children could go ~~freely~~ alone, and play unsupervised. Nearby, woods and running water; a mountain or hill to visit now and then, and perhaps a lake or an ocean; accessible, shady country roads—grass-

⁴¹ Stevens, Bertha. *Nature; the child goes forth*. Boston, Houghton Mifflin company, 1936. 278 p.

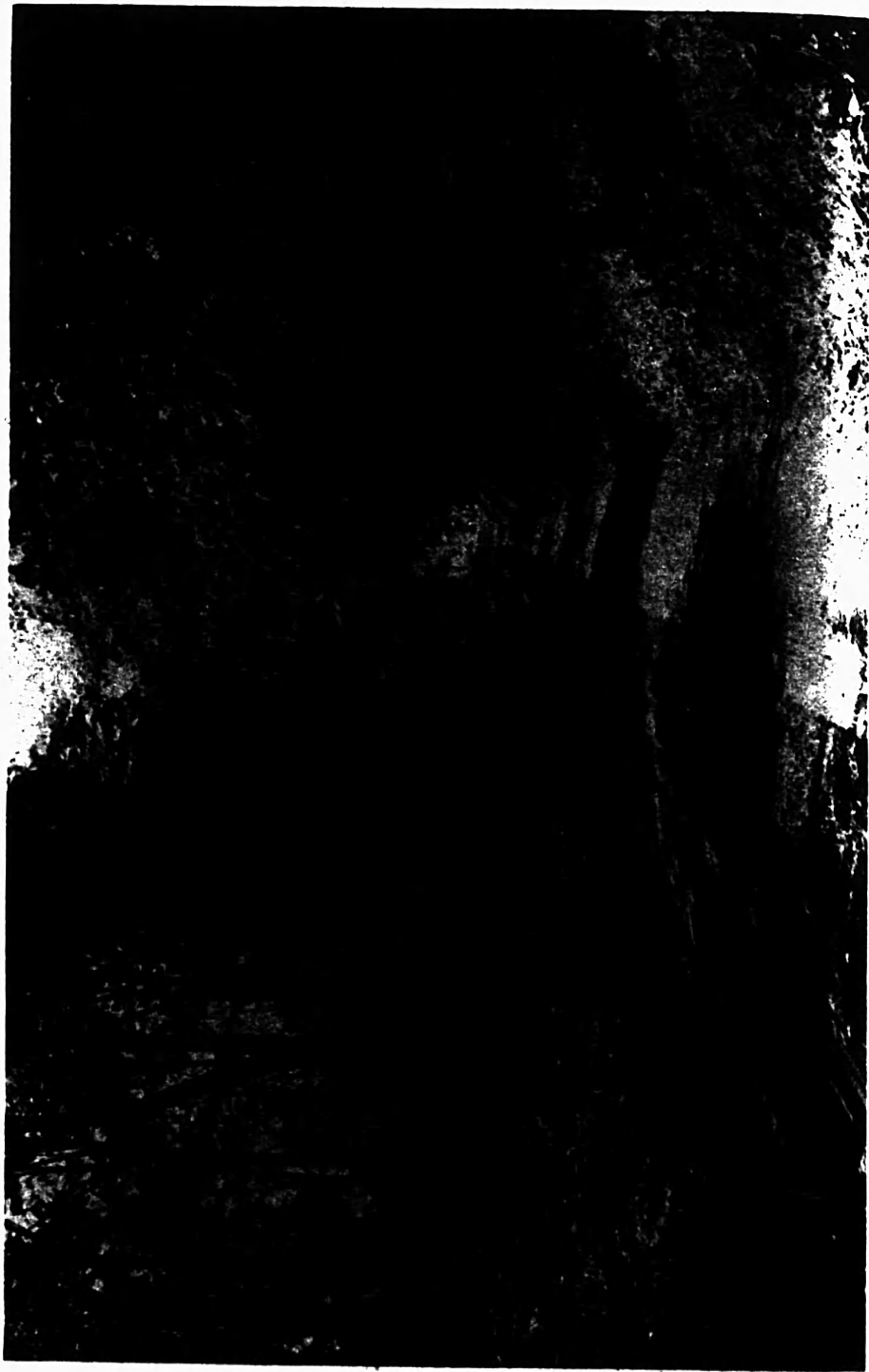
bordered dirt roads that wind, and pass over little streams, and offer no attraction to motor-driven cars.

The nature environment suggested above for wholesome living for the city child is desirable as well for his instruction in conservation of natural resources. Although eroded hillsides, shy birds, and daisy-covered meadows cannot be brought to city children, pupils in some city schools can be taken to the country where opportunities for first-hand conservation experiences exist. Many city schools have school busses and other means of transportation which can be utilized for excursions.

Whether or not city pupils reach the country, there are contacts with nature which help them appreciate the need for conservation of wildlife or soil. For example, it is no uncommon experience today for one to walk along a noisy city street in spring and see exhibits of mountain laurel, dogwood, and violets in a florist's window and in the late summer fringed gentians, black-eyed-susans, Queen Anne's lace, bittersweet, and hardy asters. It is helpful and inspiring for a teacher to take a group of children to see such displays and discuss the habits of the flowers when growing wild, the need for conserving them, their range and location, and the like. In most cities parks are accessible where there are birds, flowers, and trees for study and protection. Squirrels are easier to study in city parks than in the country. They are tamer, and children can feed them, observe them frolic, become acquainted with their habits, and think of ways to protect them.

If there is a woods or forest near the city, excursions can be made to study forest facts. Here children have an opportunity to observe forest litter and see how it is made, to watch a brook and observe a collection of soil where the channel turns or the flow is obstructed, to study trees and learn to identify common ones, to study forest birds, to understand why the birds and flowers and trees should be conserved. Children interested in soil erosion and ways of controlling it can reach the country by short journeys to observe effects of erosion such as gullies, rain-washed roadside cuts and terraces; they can study methods of control, such as check dams, grassed waterways, and contour furrows.

When a trip to the country is impossible, excursions to excavations and vacant lots may serve the purpose. Where soil is being excavated for buildings pupils are able to observe different



A woodland road lures excursionists.

layers of soil—top soil, subsoil, clay, and rock. They may collect samples for further study in the classroom. Many times the same type of erosion that might be seen near a country school is found in vacant lots. For example, gullies begin in vacant lots with sloping surfaces in "finger erosion," at the end of drain pipes in soft ground, or where a building is removed. Collection of mud on bordering walks after a rain is evidence of sheet erosion.

Sometimes different pupils, alone or in small groups, have opportunities to go to the country on week ends. A conservation study begun in the classroom can thus be extended to fields and streams. Pupils who study thus first hand can survey the community they visit, keep a record of their observations, and report to the class as a whole. Sometimes they have opportunity to bring exhibits of soil to the classroom, forest litter, grass-root loam, clay, muck, and wild flowers for study.

Perhaps the teacher cannot go to the country with individuals and small groups. She can, however, help them plan fruitful excursions. For example, she can suggest correct ways of gathering flowers, what flowers can be plucked without danger of destroying the species, and the like. She can mention types of soil and other materials needed for classroom study. She can request the pupils to observe the attitudes of people toward Nature, report habits which should be corrected. Do the children, for example, see excursionists pulling flowers ruthlessly by the roots, cutting away large portions of beautiful roadside patches, tearing clusters of colored leaves from autumn trees? When they report scenes of this kind, the class can plan constructive measures of preventing such waste and desecration on the part of people they know. Posters placed in suburban stations are sometimes helpful. Folders containing conservation facts can be planned and carried home by children whose friends and parents frequently spend week ends in the country.

There is no reason why school children in small cities should not cooperate with interested community groups in establishing community forests. Different groups of children can develop bird sanctuaries, nature trails, wild-flower patches; can plan labels, with folders of information; draw cartoons; formulate slogans. Such excursions as are necessary can be made on week ends or after school with parents or teachers.

Rural schools.--Country schools have more opportunities than city schools for first-hand contacts with natural resources. In some rural schools the need for conservation of natural resources has not been realized fully by the adults in the community, and, until the teacher has made the children aware of the problem, that community may never conserve. There a gully means only a big ditch. Boys regard wild flowers as weeds, and girls carelessly pluck them, braiding them into wreaths or carrying them about in damp, warm fingers until withered, not sensing their rareness, and not conscious of their natural beauty.

Country pupils have quick access to natural resources. They can observe gullies or strip farming as easily as a class in a city school can arrange to work in the science laboratory. However, there are difficulties to be overcome in rural situations, both in consolidated and in one-teacher schools.

In a one-teacher school, if the teacher desires an excursion for the pupils of one class or group, she must include other groups. Since the teaching of conservation is so largely dependent on field trips, it is well for the teacher and pupils to organize the work in conservation round a single large center of interest for all grades, thus drawing all groups together in major activities, each participating according to ability or interest.⁴²

For example, with the protection of wild flowers as a single center of interest to unify the work, all grades can utilize an excursion to study hardy asters and decide whether or not to transplant them on the school ground. Older pupils can secure samples of soil in which the asters grow. They may wish to test it. They can compare the natural location of the asters with that of the wild-flower garden on their school ground. If without testing their soil, they know that their school ground is suitable for asters they may wish to dig the plants. Younger pupils can use the excursion to identify asters, to note the stage of growth at the time of transplanting, help select the plants to be moved with care that the patch may not be destroyed, observe the root growth and its effect on soil texture. If the plants are in bloom, younger pupils can gather a small bouquet for the schoolroom, taking care not to destroy the roots of plants, gathering only a few blossoms, thus leaving the patch intact for the next passerby to

⁴² United States Department of the Interior, Office of Education. Good references on conservation education in elementary schools. Washington, U. S. Government Printing Office, 1938. (Bibliography no. 70.)

enjoy. The follow-up activities of younger pupils, will be different from those of older children. The primary class can tell the story of the excursion. Older pupils can enter their records in diaries, write the story of their experiences in transplanting asters for the school paper, read for further information about asters, and the like.

In the consolidated school the situation is slightly different. It approximates the city school in that teachers of separate groups or grades need not include other groups. However, it frequently happens that different classes are interested in the same conservation problems and interest spreads from one grade to another. Sometimes groups of pupils from different rooms are interested in problems which do not appeal to other members of their respective classes. Community participation, which is more possible in country than in city, frequently unifies the interests of pupils. Therefore, while it is possible for a classroom teacher in a consolidated school to have excursions independently it frequently happens that the more worth-while activities are those of interest to many grades or all grades and should be developed accordingly. Examples of projects of interest to the entire school and frequently to the community as well are nature trails, wild-flower gardens, filling of gullies, bird shelters and feeding patches, roadside plantings, picnic spots, preservation of local culture.

Primary pupils.—Excursions are encouraged for primary children, not to have them learn facts, but to gain impressions which can be expressed in different ways, to widen their social environment by contacts with people who are engaged in different types of conservation, as well as their physical environment. The excursions in which they participate, however, must be adapted to their mental and physical ability and to their needs.

Primary pupils cannot travel as far as older pupils nor wait quietly for opportunities to observe birds; they get less out of interviews with officials than older pupils and have not the physical strength required for certain conservation activities. However, they may undertake short journeys, such as a trip across the street to see how mud from an ungrassed terrace has been washed onto the sidewalk; a journey to a neighbor's yard to observe a robin's nest; a short walk to observe a "tree doctor" painting "wounds" in trees, filling cavities, cutting away dead branches; a journey to a garden, roadside, field, or vacant lot to gather samples of soil. They can observe such obvious things as

the difference between a garden and a weedy lot, a moist garden and a dry one, the effect of water on an ungrassed slope or terrace; they can collect material such as leaves, roots, soil for very simple studies, and learn that nothing should be taken without the owner's permission.

For very young pupils excursions should be simple and the activities developed spontaneous and childlike. Young children cannot be shown a large number of things on an excursion and be expected to return with very definite ideas. They can learn to identify a few wild flowers, can be taught which flowers can safely be plucked, and can bring home a few specimens. They should not be asked to observe how flowers grow, the kind of soil they need, whether or not particular flowers are the right kind to bring home for a wild-flower garden. Each of these needs study as well as observation. With primary pupils, even more than with older children, it is important that excursions be followed by concrete activities. Even very young children can influence their schoolmates to protect flowers by such activities as taking a number of wild flowers to different rooms and asking the pupils to guess what they are and telling how they can be protected. Children who can name the most wild flowers can be given recognition.

From a whole-school excursion to identify birds, to study wild flowers, or to study methods of erosion control, primary pupils receive stimulation for English, dramatics, art, and construction. A cooperative story about wild flowers seen and identified is a useful follow-up activity. The children may wish to play at driving a farm tractor or plowing furrows around a hill in a pasture, or damming gullies. On a map made by the older pupils, they can learn to recognize important hills or streams and thus learn to read maps. One group of primary pupils, with the help of the fifth grade, built a forest ranger's station on the school ground.⁴³

Individuals within a group.—Like any other activity, an excursion should be adapted to the needs of the group as a whole and to the needs and interests of individuals within the group. Provision should be made for the pupil who is not interested in the problem which appeals to the majority of the pupils. For example, if a class plans an excursion to study forest soil and the effect of trees

⁴³ Bathurst, Effie G. Progress in teaching conservation. *School Life*, 23: 41, October 1937. (See illustrations.)

on the erosion of soil, a special interest should be sought and planned for the pupil who made a study of forest soil in his preceding year's work. Perhaps he can study tree diseases, good and poor ways of cutting trees, or the work of the Civilian Conservation Corps in the forest visited. If a forestry unit has no particular value for him, he can sometimes be allowed to take another type of excursion by himself or study forest streams and compare them with meadow brooks in their tendency to carry mud.

In some classes there are pupils who have not had certain experiences familiar to the majority of the class. Some teachers plan to go with these pupils on Saturdays or holidays. For example, in a small town, where many children are familiar with different kinds of erosion, three or four pupils may have come from the city and never have seen gullies or check dams or vines used to control them. If the class is unlikely again to take an excursion in which the new pupils can observe gullies and the means of their control, the teacher can plan a walk or a drive for them. The same provision can be made for children who need special experiences with wild flowers, birds, minerals, or any of the natural resources.

FOLLOW-UP ACTIVITIES

Diaries, Journals, and Other Records

Children should keep in some permanent form the important notes taken on their excursions. Class and individual diaries make useful records, especially for a long excursion, such as a trip to the schools in a neighboring county to learn what is being done in soil conservation or bird protection. The contents will be particularly useful if the children are allowed to select what they write. No adult would like to be told what to write in his diary. Children often feel the same way about it, and after they understand the purpose of a diary take great pleasure in keeping one. The manner of keeping a diary can be discussed in English class. It is not necessary that the children all follow the same form. Sample diaries in modern English texts can be compared and helpful characteristics indicated. After talking about different forms and uses of the diary, children will enjoy deciding what forms they like best, what types of book to use, whether to write with pencil or ink, or what illustrations and covers to use. The

children should decide on these points after having discussed the matter in class.

The same standards of form apply to the journal, which is a record of weekly incidents, or occasional experiences or information which they are able to write at opportune moments, but not necessarily every day. Class or committee journals probably are more useful if they are kept uniform in size, form, and shape. Children of lower grades gain ideas from older pupils for improving their diaries and journals.

Records of excursions can be kept in ordinary notebooks which are made in connection with the unit of study to which the excursion contributes, with certain sections devoted to excursions. Each individual can have a notebook for the study, and there can be a large notebook kept as a permanent class record and left in the school library. Records need not be confined to written information. Sketches, diagrams, photos, tables, and other pictorial records are often more interesting.

In order that things learned on an excursion may be as useful as possible, the class should devise some plan of organizing and filing the records for future reference. If the pupils have kept notes in separate books according to subject, the organization of the books on the shelf can be made in the same way. For example, notebooks on birds can be kept in one place, notebooks on flowers in another, and so on. Pictures and photos, if kept in scrapbooks, can be arranged alphabetically either by subject, such as birds, flowers, soil, and the like; or by activities, such as collections, excursions, plays, and poetry. Pictures and photos can be filed in folders or in conveniently shaped boxes or mounted in scrapbooks. Notebooks can be arranged according to subject on some low library shelf for the whole class to use.

Letters of thanks and expressions of appreciation to those who made the journey pleasant should be part of the follow-up work. Many people, such as parents who donate food or transportation, guides in factories, quarries, or dairies, and drivers of busses contribute decidedly to school excursions. Much practice in writing is afforded in formulating appropriate notes. Pupils can discuss what they wish to write and study the rules of grammar, punctuation, and letter form. Through the Junior Red Cross, pupils can arrange to engage in correspondence with children in the places visited and exchange exhibits and information.

Displays and Exhibits

Collections of specimens which children have secured through conservation excursions, if carefully preserved, can be used throughout the year. A collection of rocks and minerals is an example. If it is properly assembled, labeled, and boxed, the children will be able to refer to it with ease at any time. The same is true of exhibits of soil, wood, birds' nests, pressed flowers, and the like.

Children will find information about pressing and mounting specimens of leaves and plants in a high-school botany. It is not necessary to buy glue or strips of gummed paper or linen. Strips or scraps of clean white cloth brought from home can be used in the same way as glued paper or linen. Paste made of flour is inexpensive, and where it will not hold a specimen securely, a needle and heavy thread can be substituted. Ordinary cardboard of gray or brown, covered tightly with old white cloth, can be substituted for expensive white paper for mounting purposes. The children should discuss the use of other inexpensive materials for mounting their specimens of leaves, flowers, seeds, cones, and woods, and decide which will be most appropriate.

A class can make blueprints of leaves and parts of plants which they collect on excursions and preserve these as an aid in identifying new materials. Instructions for making blueprints are given in *The Classroom Teacher*⁴⁴ and in *School Activities and Equipment*.⁴⁵

Cases are desirable for such specimens as minerals or seeds. Cases of uniform size with glass tops or a glass top and front are best. Glass can be cut by a glass cutter or hardware merchant at a reasonable price. Heavy paper can be used for mounting leaves and roots of plants. Large, heavy cardboard is desirable for display of wood specimens. Exhibits of soil can be preserved in small bottles. If desirable, these can be fastened to the sides of a conveniently shaped box by small wires or a string; or they can be laid in a shallow box with labels well exposed to view. Labels should indicate where the soil was found; kind of rock from which it was formed; its nature, whether topsoil, subsoil, or clay, and the like. Helpful suggestions for

⁴⁴ *The Classroom Teacher*, 8: 260, 1927.

⁴⁵ Knox, Rose B. *School activities and equipment*. Boston, Houghton Mifflin company, 1927. p. 62.

the arrangement of exhibits are found in the *Eighth Yearbook of the Department of Supervisors and Directors of Instruction of the National Education Association*.⁴⁶

Conservation displays which result from field trips may include collections of leaves or pressed wild flowers from the local community; of insects, which farmers consider injurious, and of noxious weed seeds or pressed weeds. The conservation exhibit can well be a part of a regular exhibit or museum which is maintained from year to year.

Some suggestions for housing a school museum are applicable also to the conservation exhibit.⁴⁷ In a large school, an empty room can be used for a museum. In small schools, corners of classrooms are sufficient. In one-room schools where space is usually at a premium, exhibits are frequently changed or limited to one subject at a time.

The use of a conservation exhibit need not be confined to the class or school which makes it. An article for the use of children's museums in general⁴⁸ gives suggestions for uses which can be applied to the conservation exhibit. For example, single displays which are not being used, or duplicate displays, can be lent to other classrooms or to other schools. A children's museum in a certain city⁴⁹ under the control of the board of education maintains both a lending department and an exhibit department, where both permanent and temporary exhibits are shown. The collections consist of specimens, pictures, and many kinds of illustrative material. One person has charge. There is no reason why a school should not have similar exhibits on conservation with individual pupils in charge. If displays and exhibits are to realize their greatest educative possibilities, they must be used. This means that the studies in conservation which are carried on from week to week should as frequently as possible incorporate materials which the children have collected.

⁴⁶ Materials of instruction. *Eighth Yearbook*, Department of Supervisors and Directors of Instruction, National Education Association. New York, Bureau of Publications, Teachers College, Columbia University, 1935. 242 p.

⁴⁷ Travers, C. E. Housing a school museum. In *Thirteenth Yearbook*, Department of Elementary School Principals, National Education Association, 1934. Washington, D. C., The association.

⁴⁸ Walker, Rowena Smith. How schools use the children's museum. In *Thirteenth Yearbook*, Department of Elementary School Principals, National Education Association, 1934. Washington, D. C., The association.

⁴⁹ Ibid.

School Magazines and Newspapers

A successful way of disseminating information which children gain on a conservation excursion is through articles to a school or class paper. Such articles should be written in language suitable for pupils of different grades. Suppose an eighth-grade pupil takes an excursion to study control of soil erosion and wants to write an article for younger pupils. He can talk with children of the middle grades or of the primary grades, find out what experiences they have had in connection with soil erosion or its control, and then write about these experiences in simple language.

Editors of the local dailies or weeklies in the community are often willing to publish some of the best articles which the children write on conservation. Upper-grade classes sometimes write sufficiently well to have charge of a conservation column in a local daily, including slogans which they have developed for nature trails, conservation mottoes, and the like. Such a column can also contain news about conservation undertakings on different farms in the community, national conservation news, reviews of new books on conservation of interest to children or adults in the community, titles of recent conservation bulletins or magazine articles. Frequently the articles submitted for a school paper or a local daily can be made the subject of class discussion giving the group an overview of their conservation unit.

Map-making¹⁰

A local inventory for rural children who are studying conservation can be thought of as serving the purpose in their study which regional planning serves the Government in its conservation program for the Nation. An inventory of natural resources and methods of conservation can be shown on a map. In mapping a local environment outside the schoolroom or home, children recall what they have learned about mapping the schoolroom, their smallest environment; a room at home; or a nature-study plot. After having mapped a simple environment, they can plan a map to show erosion control practices on some farm in the community. In learning how to do this type of mapping, it may be necessary at first for the class to study the farm, to

¹⁰ Hall, Robert B. Local inventory and regional planning in the school curriculum. *Journal of Geography*, 33: 17-22, January 1934.

walk over parts of it in which they are particularly interested. When they return to school they can practice mapping a field, for example, which contains a gully. Class discussion will aid the pupils who are unable at first to make a satisfactory map. The county agent or a soil specialist can be asked to tell the children how he maps the community in order to locate its needs for conservation and specific land uses.

Although children's maps are sketches rather than maps in the geographical sense, the work requires very careful observation, thoughtful analysis of what is seen, and class discussion with help from the teacher in removing difficulties. By completing this type of work each child sees his community with the needs of all its parts related to the whole. In planning a map of the entire community each child can first be responsible for his "home farm." A list of maps to develop in connection with conservation excursions contains the following: Maps showing distribution of gulleys in the community, bird sanctuaries, homes with bird houses, bird baths, and other types of protection of birds, natural haunts frequented by certain kinds of birds, shelter-belts, groves which protect soil by breaking the force of the wind, and trees or shrubs of value for their scenic beauty.

One writer⁵¹ suggests adaptation of ideas from the "regional survey method" of Great Britain, a complete regional survey of the British Isles made by the children of the nation. Each child uses a base map of the surrounding region, furnished the teacher for him, and maps a certain area. Sometimes a whole map is assigned as home work. This type of mapping can well be applied to American children's study of conservation, especially with respect to protection of the soil. From such a study one can expect children to gain better understanding of map reading, improve their ability to make maps for their own study, increase their ability to make accurate observations with respect to erosion and other conservation needs, and a broad understanding of the local community with respect to its soil needs, protection of birds and wild flowers, of minerals, and the like.

An interesting activity⁵² to follow a local trip is to model or draw the farm or the community, as it might appear 10 years

⁵¹ Straw, H. Thompson. A new kind of geographic field trip. *Peabody Journal of Education*, 12:120-22, November 1934.

⁵² Givens, Willard E. School journeys in citizenship. *American childhood*, 19:5-6, 45-47, February 1934.

from now. To do this, children note the type of conservation, prepare a map of the community to show places where conservation is needed and where it is being carried on. After this, they can have a discussion to decide what is expected of various conservation activities, such as sanctuaries for birds, the damming of gullies, or the pasturing of fields which are subject to serious washing or wind erosion. When the children have taken several excursions to study the community or farm to be mapped, they are ready to begin work.

If they work on a sand table, they can mold gullies and plant grass seed or lay in soil to fill them. They can erect toy shelters of trees and shrubs to attract birds. If there is a large dam in the community which provides water for light and power, and which has been collecting silt, the children can do one of two things: They can imagine that no efforts have been made to protect this dam from collecting silt and becoming useless and then show it completely filled with muddy silt and overgrown with swamp and weeds; or they can think of ways to control the washing in the upper part of the watershed by reforestation, correct farming, damming, and the like, and so prevent the pond or reservoir from being filled with silt. In the latter case, 10 years hence, the community would have a clear, clean reservoir providing drinking water, with falls for power and electricity for the community.

EVALUATION

Achievement of Pupils

A questionnaire study of the value of field trips in general⁵³ shows "that a large majority of principals from whose schools (268 public elementary schools scattered throughout 45 States and the District of Columbia) trips are taken consider them of high value." A few consider trips of medium value, but it is interesting to note that none of the replies to the questionnaire rated them of little or of no value.

Conservation excursions are successful to the extent that they lead to achievement in line with conservation goals. Did the pupils accomplish their purpose? Have they acquired new interests, or was the excursion ended when they left the farmer's field? Do they realize with greater poignancy the social signifi-

⁵³ Price, R. H. Op. cit.

cance of the problem they went forth to study? Do they realize more fully the importance of cooperative effort in the Nation's solution of its conservation problems? Such questions indicate the nature of the results to be expected of conservation excursions. For convenience, the most important results can be discussed as purposes achieved, continuing interests, and socialization.

Purposes achieved.—Excursions are worthwhile when the children return with the feeling that they have accomplished a definite purpose. If the trip is a pleasure jaunt, the pupils should have a good time. If the children seek information, the journey should afford facts or other help in answering specific questions. Similarly excursions taken to gather materials for study or to improve conservation activities should result in the accomplishment of the goal. Otherwise the time has not been as well used as possible, and teacher and pupils should seriously seek to locate the cause of the failure and to improve the next excursion. Progress should also be made toward the achievement of the teacher's goals which frequently have more far-reaching implications than have the purposes of the pupils.

Continuing interests.—Successful excursions usually afford interesting new experiences for the children, about which they are inclined to ask questions. Many questions should be reserved for further study after the class has returned to the classroom. Children's continuing interests in excursion experiences depend somewhat upon the type of excursion and whether or not anything can be done about the things observed. For example, children who have studied about birds that nest on the ground and have seen such birds as pheasants or quail flying into grain fields will become concerned about the cutting of the grain. Is there anything that can be done to protect the nests and young in the field? By reading and study the children may learn about devices which farmers can use and through them some farmer may decide to attach a weighted screen to the neck-yoke of his machine, thus frightening the birds into flight in time to raise the sickle and leave eggs or young unharmed. Children who have taken an excursion to observe how some farmers protect birds which nest in their fields may stimulate the children to search Government bulletins and other material for facts about other devices for protecting field birds.

Children who learn to identify certain flowers of a species will be interested in learning about others. They will enjoy compar-

ing the native plants of different communities and noting the effectiveness of sumac and other shrubs and wild flowers in brightening fence corners and at the same time protecting birds, and in keeping up the protection. Interest in wild flowers gained from school excursions in one grade may continue in other grades and through life, leading one to gain pleasure in wild flowers, to protect them, to study them in their native regions as business or pleasure expands his environment, and possibly to follow wild-flower gardening as a hobby.

Socialization.—During the middle and upper grades of the school, the more an excursion is made a part of the regular school program the more valuable it will be in the children's experiences. A study of community life first-hand, meeting important people who are aiding in the development of the community, and studying the lives of people who gave service in the past, cause children to have respect for the contributions that people make to ways of living. In one school,⁵⁴ where many trips were planned, interests begun through excursions became leisure-time activities. In writing about their impressions of the value of an excursion, a group of pupils made such statements as the following:

Sometimes when I enjoy a trip I have taken with the class, I ask my mother to go with me again. * * * My mother owns tenement houses on the East Side. My trip to see housing conditions has convinced me that property owners owe something more to their tenants than a place to live in.

Other socializing experiences result from excursions. An excursion to study problems of soil erosion and its control in the home community can lead the children to study current daily newspapers and periodicals which give information about these problems. Interviewing community leaders will help children check on the facts gained through an excursion, especially if such interviews are discussed by the teacher and the class and questions decided upon. Making a bibliography of conservation bulletins to serve the community can result from a survey of the community's literature on conservation and contributes to appreciation of a certain type of social service.

⁵⁴ Harden, Mary. Going places and seeing things. Educational Method 14:324-31, March 1935.

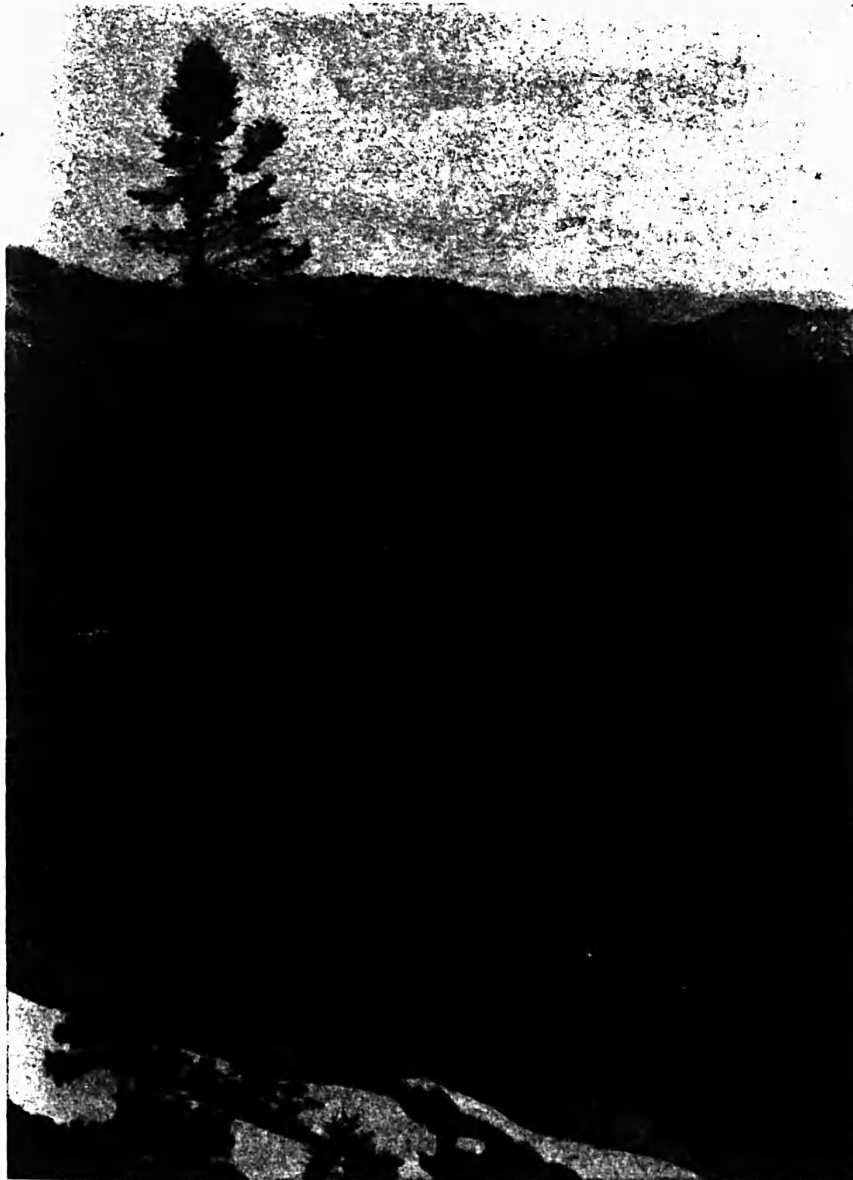
Improvement of Future Excursions

The teacher can improve her technique of planning and conducting excursions by carefully evaluating each one. If the excursion was unsuccessful, it is well to analyze the situation. Wherein was it unsuccessful? Did the children waste time? If so, why? Was there lack of planning? Did they allow their enthusiasm to cause them to talk all at once and so interrupt discussions? Were they slow in coming together into a group for discussion at any particular point? How can these disturbances be avoided? Perhaps the teacher was at fault. Did she plan carefully? Make preliminary visit? Read and study sufficiently? Guide the pupils wisely in their planning? Did she bring the children together skillfully for observation and discussion of points of common interest on the journey?

Good excursions result from setting up evaluating standards. However, standards cannot be jotted down, as it were, by the teacher as she analyzes an excursion. They must be established gradually by pupils and teachers as the pupils feel the need for them. If the children are not satisfied with the results of an excursion, they should discuss it and plan ways of improving the next one. Miscellaneous criticisms will arise, but among them will be suggestions for improvement. For example, on a bird trip, perhaps laughing or talking resulted in the flight of the birds. For the next trip there must be "quiet times" to which all pupils adhere. Perhaps there were not enough bird guidebooks to enable all the children to identify certain birds. The class must buy or make some. Or there may not have been "enough to eat," or the walk was too long, or the children scattered and some failed to see a rare flower, or someone climbed on a farmer's wagon and fell. One committee may have returned to the classroom with a poor report. Perhaps an individual who took the responsibility for certain information failed to secure it. For recognized failures and shortcomings the class should discuss means of improvement.

Successful excursions as well as unsuccessful ones should be used as stimulants to improvement. Factors in the success of one excursion can be helpful in establishing standards for another. Eventually a school or class can develop technique for successfully integrating the excursion with the conservation program emerging with increased appreciation of the Nation's need for a better

husbandry of its remaining natural resources, with ability to participate in activities of conservation and with a never-failing urge to become more understanding conservationists.



National and State parks afford excursionists many scenes such as this in Yosemite National Park.

APPENDIX

Content of Excursions

The following list of suggestions is intended to be illustrative only, not complete. Excursions should be selected for definite purposes and planned for integration with appropriate units of work or other major activities. Follow-up activities vary. Some contribute to units being developed; others are the beginnings of new units; and still others, while not contributing directly to units, are necessary merely to satisfy the children's curiosity about things observed. The choice of follow-up activities is influenced by the children's purposes for the trip. No adaptations are suggested for individual or grade differences. Suggestions for organizing curriculum units on the conservation of the natural resources are given in U. S. Office of Education bulletin, "Teaching Conservation in Elementary Schools," No. 14, 1938, which can be secured from the U. S. Government Printing Office.

Books of information and identification and activities are listed in the following publications of the Office of Education:

Good references for conservation education in secondary schools. Bibliography No. 55.

Good references on conservation of trees and forests for use in elementary schools. Bibliography No. 71.

Good references on conservation of birds, animals, and wild flowers for use in elementary schools. Bibliography No. 72.

Good references for conservation education in secondary schools. Bibliography No. 70.

Soil

Where to go and what to see	What to do	Further activities
Pasture: Hillside overgrazed. Grass roots holding soil. Loose soil blown away from overgrazed places. Contour furrows to prevent washing. Gullies started as a result of washing or of overgrazing. Check dams, shrubs, or vines for gully control.	Gather samples of soil. Take up small pieces of sod for study. Sketch the shape of contour furrows. Note breaks in these which might start gullies. Make sketch of gullies.	Study to answer questions which arise on the journey. Get a farmer's permission to fill a small gully. Make a sketch of the land about a gully, including the gully. Make other visits to the gully and record changes on the sketch. Secure small bottles to hold samples of soil gathered and plan labels for these.
Fields: Soil washed to bottom of slopes. Sickly crops on eroded slopes. Healthy crops at foot of slope. Gullies. Strip cropping. Contour ploughing. Sheet erosion.	Gather samples of soil. Collect a few types of plants. Measure height of plants in different types of soil. Measure height of plants on slope of hill and at the base. Make sketch of strip farming. Make sketch of gullies and other types of erosion.	Press specimens of plants. Write articles for the school paper telling how the farmer visited is conserving the soil. Write an article for the school paper on the importance of stopping gullies. Plan posters showing the importance of saving soil and place in the window of an empty store. Consult a farmer concerning his plans for crop rotation.

<p>A farm where no erosion control is practiced for comparison with a farm where erosion is controlled:</p> <p>Productiveness.</p> <p>General prosperity.</p> <p>Types of control needed.</p>	<p>Measure plants and note their healthy or sickly appearance.</p> <p>Inquire about yield per acre on each farm.</p> <p>Decide whether or not the farms "pay."</p>	<p>Draw a map showing where the best farming land in the community lies.</p> <p>Study to determine what part erosion control plays in productiveness of the land in the community.</p>
<p>Grass after heavy rain:</p> <p>Soil washed from slope and collected on grass at foot of slope.</p> <p>Depth of moisture in soil at roots of grass.</p> <p>Depth of moisture on slope compared with depth of moisture at foot of hill.</p>	<p>Note fineness of soil collected on grass.</p> <p>Note ability of interwoven roots to hold moisture.</p> <p>Compare amount of moisture in different types of soil.</p>	<p>Write article for school paper or notebook on the effect of grass in the prevention of erosion.</p> <p>Study the effect on the Nation of the plowing of its grass.</p> <p>Attend a showing of the movie entitled "The Plow."</p>
<p>Cropland after rain:</p> <p>Soil washed on plants at foot of hill.</p> <p>Rapid drying of soil on slope or top of hill.</p> <p>Extra moisture at bottom of hill.</p> <p>Soil washed from slope to foot.</p>	<p>Measure depth to which moisture sank on hillside and at foot of hill.</p> <p>On strip crops note soil washed from open crop to close crop.</p> <p>Note soil collected in close crop and not washed onto open crop.</p> <p>Note new landslides in gullies.</p> <p>Note particularly "muddy" spots and try to explain them.</p>	<p>Write article for school paper or notebook on the effect of strip farming on erosion.</p> <p>Plan ways of protecting soil in the school garden.</p> <p>On a map of the community, locate the best "cropland."</p>

¹ See also pages 6-10, 27-28.

Soil—Continued

Where to go and what to see	What to do	Further activities
<p>Farm where erosion control is practiced: Types of control, such as strip cropping, contour plowing, grassed waterways, check dams in gullies.</p> <p>Roadside cuts: Layers of soil. Roots of trees. Washing away of soil and finger erosion.</p> <p>Erosion control with shrubs, vines, and terraces. Soil washed from slope to pavement.</p> <p>Vacant lots: Layers of different kinds of soil. Roots of trees and large plants and the way they break the soil and loosen it. Finger erosion. Beginnings of gullies.</p>	<p>Note kinds of crops raised. Note relative proportion of grass to open crops. Observe success of erosion control.</p> <p>Make sketch of terraces or plantings used to prevent washing. Learn what plants are useful in preventing washing on roadside terraces.</p> <p>Make sketches of finger erosion or small gullies. Sketch layers of rock or roots of trees in excavations.</p>	<p>Plan a way of filling some small gully near school. Get owner's permission to fill gully. Consult owner of farm to learn whether he thinks erosion control pays.</p> <p>Select an unprotected roadside grade near the school and plant shrubs, vines, and terraces to protect it. Make sketch showing erosion on a roadside grade and observe this grade from week to week making further sketches to show changes.</p> <p>Get permission to experiment in the control of erosion on the lot. Get permission to use the lot for a school garden.</p>

Water

<p>Schoolyard during rain: Washing of soil in car tracks. Beginning of gullies under eaves of schoolhouse. Falling of water under trees, slowly. Relatively severe washing on unprotected hillside. Gentle rain slowly seeping into school garden. Heavy rain washing soil in garden. Creek after heavy rain: New deposits of silt. Bends in creek where most silt is deposited. Power of water to carry rocks. Where rocks are dropped. Location of pebbles and fords. Collection of silt by fords and dams. The height of water as indicated by soil on grass or plants. Condition of culverts or footbridges showing power of running water.</p>	<p>Gather samples of rain water as it falls. Gather samples of muddy water that has run off school garden. Put out flat pans and measure depth of rainfall. Dig into soil in grass or garden and into soil in roadway or ungrassed playground and compare estimated depths of moisture. Determine increase in height of water by pole driven near water's edge before the rain. Make collection of articles washed by water. Compare size of rocks deposited at different points and try to account for the difference.</p>	<p>Keep a record of the amount of rainfall in different rains of the season. Compare with rainfall in other rainbelts. (See geographies.) Measure depth of gully at beginning and end of season. Try to stop the gully. Study how best to do this considering size of gully and type of soil. Report washed-out culverts to proper officials. Plan a way to decrease the amount of silt from one of the branches of the creek. Rebuild small fords. Make a map of the creek and the land it drains. Locate on the map the tributaries which have beginnings in gullies. Study about the flood problems of the Nation. Learn what is being done to control them. Write to the United States Weather Bureau for weather maps.</p>
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Water—Continued

Where to go and what to see	What to do	Further activities
<p>Silted pond or reservoir: Collection of silt in bays or irregular shore line. Filling of tributaries with silt. Danger of stagnant water caught in bayous. Mills or factories in disuse because of insufficient power.</p>	<p>Sketch a tentative map of the watershed showing the rivers and creeks which flow into the pond or any part of it that can be seen in a single excursion. On this map indicate forests, check dams, terracing, and other methods observed of preventing soil from washing and of causing water to remain on land instead of flowing into the rivers and the pond. Sketch reservoir with unused factories.</p>	<p>Consult an expert such as a county agent to learn why the pond is filling with silt. Write an article for the school or local paper about the silting of the reservoir and the likelihood of its being completely filled with silt. Write an editorial for the school or local paper on what the reservoir means to the community and why the silting should be prevented. Transfer the information from the tentative map to one to put in scrapbook or library. Study change in usefulness of pond or reservoir as compared with earlier days; effect of these changes on life of community.</p>

Falls to observe power of water:

Amount of water.

Machinery run by them.

Slope of valley.

Cause of falls.

Erosion as a cause and a result.

Use made of falls.

City or community water supply and filtration plant:

Kind, whether a well, stream, lake, or a standpipe:

How kept pure.

Difficulties in the way of keeping the water pure; such as factory wastes.

City reservoir:

Cleanness of water in small streams.

Freshness of air.

Build a toy water wheel to get an idea of the power of the falls (if small and not dangerous).

Inquire about the falls or dam sites as a source of power for machinery.

Note the machinery which is necessary to supply the residents with water.

Inquire about the cost of the city water supply.

Learn how the city water is kept pure.

Sketch a map of the community and locate the sources of power from running water. Make a list of the important waterfalls in the United States and mention the kind of industries in which their power is utilized.

Study the success of reservoirs designed to be used for power and for irrigation as compared with single-purpose reservoirs.

Study what scientists believe to be the effect of forested watershed around reservoirs.

Learn more about means of keeping the water for the city pure.

Send different samples of water to the experiment station of your State university for testing.

Estimate the amount of water used by city or school; by the average home.

Plan a simple way of piping water from a spring into the kitchen.

Plan a way to have pipes carry off waste, even if there is no source of running water for the home.

Plan a water fountain for the school and a way to keep the water cool.

Water—Continued

Where to go and what to see	What to do	Further activities
Steam boiler in schoolhouse: Size and material. Amount of water. Source of heat. Care. River or creek to observe pollution of water and killing of fish and birds: Factory wastes. Garbage and trash. Automobile batteries, etc. Ponds filled with waste, breeding places for mosquitoes.	Ask janitor to explain system for water supply. Make list of kinds of waste observed. Estimate amount or number of fish destroyed. Note size, cause, good or bad results of standing water.	Sketch water plant from its source to the different rooms of the school. Plan campaign to keep people from throwing waste in streams. Plan what to do about mosquitoes, ² whether to drain the pond, use oil on it, or try a commercial preparation.

² Vogt, William. Thirst on the land. A plea for water conservation for the benefit of man and wildlife. National Association of Audubon Societies, 1775 Broadway, New York, N. Y. (Circular 32, 1937) pp. 15-20.

Flowers:

Wild-flower patch in bloom in the community:

Species of flowers.

Color harmony.

Type of soil.

General location, whether by roadside, in meadow, or woods.

Correct way of plucking.

How flower parts of different flowers are alike or different.

How the pollen is carried.

Plants in danger of extermination.

Bees, butterflies, or birds in the vicinity.

Draw a sketch to show location of different types of flowers.

Gather plants or blossoms to press taking care to collect only such as can be spared.

Pluck a few flowers for a bouquet if desired, taking care to pluck them correctly, to use a pocketknife or scissors, not to spoil the beauty of the patch for other people to observe, and not to destroy rare varieties.

Examine roots of plants and condition of soil at roots.

Take a photograph of this patch for a school or class conservation book.

Sketch a flower which you would like to use for design or decoration.

Decide whether or not a bed of these flowers would be attractive on the school ground.

Gather a sample of the soil to be tested and compared with the soil of the school ground.

Arrange flowers gathered in artistic bouquets trying different arrangements in different vases taking care always not to crowd the flowers.

Paint an imaginary picture of the flower patch at its best.

Press flowers collected and mount and label them correctly.

Make return trips to see how patch looks in different seasons.

Draw a map of the community and on it mark wild-flower patches of particular beauty. Put this map in the local post office, church, or some other place where it will interest people of the community in their wild flowers.

If the patch of flowers is accessible to other people, make it interesting for them by labeling the different kinds of plants. "Signs Along the Trail" by the American Museum of Natural History, New York City, contains suggestions for making interesting labels.

See also pages 10-12, 19-23.

Flowers—Continued

Where to go and what to see	What to do	Further activities
<p>Wild-flower patch after flowers have blossomed:</p> <p>Appearance of plants.</p> <p>Appearance of seeds and their ways of protecting themselves and spreading.</p> <p>Different flowers that grow in same place.</p> <p>Woods:</p> <p>Ferns—kind, type of soil, location.</p> <p>Moss—kind, soil, locality, manner of growing close to one another, quality of absorbing rain.</p> <p>Partridge berry—manner of growth, locality, type of soil.</p> <p>Flowering plants—manner of growth, locality, type of soil.</p>	<p>Draw sketches of seeds of different plants.</p> <p>Gather seeds for planting in wild-flower garden on school ground.</p> <p>Learn to identify plants by seeds.</p> <p>Take photographs of rare plants.</p> <p>Learn to identify.</p> <p>Cut a few specimens for pressing.</p> <p>Gather specimens for glass garden or terrarium such as partridge berry, reindeer moss, polypody, woods, or Christmas ferns, "redcap," "lion's tongue," and the like.</p> <p>Make sketches of plants in their environment.</p> <p>Plan ways to protect some of the flowers observed.</p>	<p>Place seeds with mounted pressed specimens of flowers to which they belong.</p> <p>Plant seeds in wild-flower garden on the school ground and try to preserve the plants. Plan the planting to resemble the setting in which the wild flowers bloom naturally.</p> <p>Press specimens and plan appropriate labels.</p> <p>Arrange plants gathered for glass garden with pebbles and moss.</p> <p>Make signs to protect ferns in woods.</p> <p>Establish a fern trail for the community.</p> <p>Plant fern gardens.</p>

Flower store:

- Kinds of wild flowers displayed.
- Appropriateness of arrangement.

Flower shows:

- Wild flowers displayed.
- Arrangement of display.
- Color harmony.
- Naturalness of display.
- Bouquets of wild flowers.

Flower patches frequented by bees:

- Kinds of flowers.
- Pollen and nectar.
- Uses of pollen.
- Work of the bees.

Identify unfamiliar flowers.

Learn whether flowers were plucked in woods or cultivated.

Make sketches of flowers especially interesting.

Make sketch of display.

Make a list of flowers displayed and write questions to be looked up later.

Study labels of flowers displayed.

Learn to identify unfamiliar ones.

Gather books or bulletins and learn more about the habits of the flowers observed. Visit same flower store in other seasons and note what flowers are displayed.

Discuss observations made and apply them in arranging a bouquet for the schoolroom.

Plan a flower show for the schoolroom with specimens of wild flowers collected from the community. Label specimens with name and interesting information.

Prepare posters or folders instructing guests how wild flowers may be safely plucked, what ones can be plucked, and what ones should never be plucked in the community.

Prepare speeches or discussions about the conservation of flowers in the community for conservation programs.

Plan to have honey for lunch and discuss the way it is made.

Try to secure some honey with pollen or "bee bread" in it.

Decide whether bees help protect flowers.

Observe bees with pollen on their legs.

Try to follow a bee as he flies from one plant to another carrying pollen.

Flowers—Continued

Where to go and what to see	What to do	Further activities
<p>Different flower patches in the community to discover enemies of the flowers:</p> <p>The farmer's plow.</p> <p>Road grader.</p> <p>Swamp drainers.</p> <p>Real-estate developments.</p> <p>Florists and others who gather flowers to sell.</p> <p>Thoughtless pluckers.</p> <p>People who attempt to transplant flowers without proper knowledge.</p> <p>Plant insects and parasites.</p>	<p>Learn what flowers are killed by:</p> <p>Plowing.</p> <p>Grading of roads.</p> <p>Drainage of swamps.</p> <p>Florists.</p> <p>Wrong transplanting.</p> <p>Try to think of ways in which flowers can be saved.</p> <p>Note damage done.</p> <p>Note appearance of insect.</p>	<p>Prepare posters for public information.</p> <p>Collect bulletins about the conservation of wild flowers and make them available to the community.</p> <p>Plan ways in which the community can protect the wild flowers now being destroyed.</p> <p>Study life cycles and means of control.</p>

Trees and Forests

<p>Trees on schoolground:</p> <p>Less erosion under tree than on slope beside the tree.</p> <p>Flowers, grass, or weeds with less healthy growth under or near the tree than far away.</p>	<p>Learn how to trim dead branches in proper manner.</p> <p>Preserve fallen leaves for compost.</p> <p>Make plans and rules for protection of trees on school ground.</p>	<p>Arrange and label collections from leaves and seeds.</p> <p>Choose a favorite tree for study and observe its changes from week to week during the year.</p>
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Shade. Beauty of trees when viewed from distance. Characteristic shapes. Colorful leaves in fall and colors typical of different trees. Buds, flowers, seeds, new leaves in spring. Identification by fruit, leaves, bark, branches, and general shape. Trees in a park: Kinds. Identification by fruit, leaves, bark, branches. Observation of beauty as single trees or in clumps or rows in appropriate spots. Falling leaves and what is done with them. Nests of birds and squirrels. Tree surgery. Leaf mold. Soil under trees compared with soil in open spaces. Plants under trees compared with plants away from trees. Forest litter. Exposed roots.	Choose favorite trees and paint or write about them. Make collection of leaves and seeds. Decide how many more trees are needed and why, and what ones are best. Take photographs of the trees. Make sketches of trees which have been cared for by tree doctors. Sketch the shapes of favorite trees. Select favorite trees for further study. Interview the caretaker of the park with respect to the care he gives the trees and the appreciation or lack of it which people have for trees. Get permission to take a sample of forest litter to the schoolroom.	Study trees and select a favorite tree to plant on the schoolground. Care for this tree. Develop a unit of study or activity on the conservation of trees and forests. Study the relation between trees, erosion, and floods. Plant trees at home or on the school ground and keep records of their growth. Individual study of favorite trees. Learn what kinds of trees in the park are native and which kinds are imported. Develop a unit of study or activity about the national parks. Secure and organize a collection of Government bulletins about the national parks. Make them accessible to the community. Get permission to have a nature trail in the park. Get permission to put up feeding stations for birds.
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Trees and Forests—Continued

Where to go and what to see	What to do	Further activities
<p>Trees of unusual significance in the neighborhood:</p> <ul style="list-style-type: none"> Trees which mark the intersections of highways or commemorate important local events. Trees of particular economic value. Trees imported from foreign lands. Trees noted for their age. Trees unusual in kind or size for the neighborhood. 	<p>Make sketches or paintings.</p> <p>Note how these trees are being protected.</p> <p>Try to think of other ways of protecting the famous trees of the neighborhood.</p> <p>Learn what authorities or associations protect the trees.</p>	<p>Interview people who know the facts about the trees.</p> <p>Write the story of interesting local trees.</p> <p>Make a sketch of the community and on it locate the famous trees.</p> <p>Make a collection of stories about famous local trees.</p> <p>Make a study of the historical trees of your State.</p> <p>Make a study of famous trees of the United States.</p> <p>Make labels for the famous trees of the community, writing a bit of history on each label.</p>

A woods or forest:

Kinds of trees, age of growth, whether virgin timber, second, or third growth.
 Forest waste by cutting, fire, lack of re-planting.
 Forest enemies, such as insects or diseases.
 Special kinds of trees attacked by disease and left dead or dying.
 Ways in which trees have been cut, whether suitable or not.
 Forest litter.
 Type of soil as compared with soil outside the forest.
 Plants peculiar to the forest or woods.
 Mosses such as cedar or ground pine and what they do for the forest floor.

Gather leaves or twigs for study.
 Gather specimens of forest litter.
 Gather specimens of soil.
 Gather specimens of forest plants.
 Choose favorite trees and sketch or paint them.
 Collect specimens of wood, taking care not to injure or disfigure the trees.
 Study effect of litter on soil moisture.
 Study effect of forest on stream erosion—
 Is the water clear? Where is it colored? etc.
 Plan how to develop a nature trail and decide what plants, trees, and beauty spots should be labeled. Sketch.

Organize and label collections.
 Secure and organize a collection of Government bulletins on trees and forests of the United States.
 Make a study of ways of protecting forests.
 Learn the difference between national parks and national forests.
 Learn what the Government does to protect its parks and forests.
 Find out what private owners such as lumber companies are now doing to protect the forests they own and find what part the Government has in the protection of private forests.
 Find how the forest visited is being protected from insects, diseases, and wrong management.
 Plan and paint signs and slogans for the nature trail.

Trees and Forests—Continued

Where to go and what to see	What to do	Further activities
<p>Forest nature trails:</p> <p>Plants already labeled.</p> <p>Plants and trees that should be labeled.</p> <p>Reasons for keeping narrow paths.</p> <p>Interesting trees on trail.</p> <p>Haunts of birds.</p> <p>Various kinds of labels and signs of value to the hiker.</p>	<p>Sketch trail and locate plants that need labels.</p> <p>Locate labels that need repair and plan what to do.</p> <p>Locate plants that should have care.</p> <p>Learn to identify the plants on the trail.</p>	<p>From sketches made on journey, make plans for improvement.</p> <p>Get permission to help improve the nature trail visited.</p> <p>Plan new nature trail for school, class, or community with information to be written on notices or labels.</p> <p>Make list of organizations interested in nature trails in your community. Ask representatives of these to speak to the school about the building of nature trails.</p> <p>Write to State or Federal Government departments or private nature groups for bulletins to help plan nature trails.</p> <p>Write to the American Museum of Natural History, New York City, for "Signs Along the Trail" by William H. Carr; this bulletin has suggestions for planning and improving nature trails.</p>

A stream which runs through forest and plowed land:
Compare amount of soil carried by water that runs through forest and that which runs through the plowed land.

A forest lookout tower:
Location.
View.
Advantages.

A forest ranger station.

Trees in streets or parks being repaired by surgery:
Kinds of trees needing most repair.
Methods of workmen.
Appearance of work.

Gather samples of clear and muddy water.
Gather samples of soil deposited by stream in forest and in plowed land.

Interview the lookout man regarding his duties.

Interview the forest ranger regarding the cutting of wood in his district.

Learn why the surgery was necessary in case of different trees.
Ask foreman or director to explain methods used by the men.
Ask him to discuss the importance of good tree surgery.
Draw sketches of repaired trees or take photos.

Write for State or Federal bulletins on the use of forests in conservation of soil.

Learn how the cutting of forests in the United States has affected erosion and floods.

Study about the damage done to lives and property by floods.

Learn how the Government is working to prevent floods.

Study more about work of forest protection.

Learn about the cost of forest fires in money, soil loss, and loss of lives.

Try to learn why the United States does not have greater protection for its forests.

Write to United States Forest Service for information.

Learn about the national forests—area, location, and resources of timber, water-power, and grazing lands.

Study trees at school for need of surgery.

Make a scrapbook on methods of tree surgery.

Keep a record of trees observed in different places and the way they are protected from disease by proper surgery.

Trees and Forests—Continued

Where to go and what to see	What to do	Further activities
<p>A National or State park: Beautiful scenery. Nature trails. Wild-flower exhibits. Wildlife enclosures. Trees and forest. Streams and waterfalls. Museums. National monuments. Historical landmarks.</p>	<p>Take photographs of beautiful places. Read signs and labels. Make notes to help remember points of interest. Gather literature. Observe size and beauty of the very old large trees. Learn their age. Make pencil sketches of the mountains, valleys, and waterfalls. Take a nature walk with a ranger naturalist.</p>	<p>Write to National Park Service, United States Department of the Interior, Washington, D. C., for literature about park or objects observed. Organize the literature you secure and make it available to the community by putting your collection in the local library or by inviting the community to come to school and use or borrow the bulletins and other material which you secure. Prepare reports to give to classmates unable to take the trip. Plan to show a movie about a National Park and invite the parents. Movies can be obtained from a western railroad or the National Park Service, Washington, D. C.</p>

<p>Homes nicely landscaped: Kinds of shrubs and trees. Kinds of flowers. Types of soil. Slope.</p> <p>A city schoolground. (For country children): Trees. Shrubs. Flowers. Playground space. Size of ground.</p> <p>A country schoolground. (For city children): Trees. Shrubs. Flowers. Playground space. Size of ground.</p> <p>Forest trees in the farm wood lot (individual trips): Kinds. Value outside the forest. How conserved or protected.</p>	<p>Make sketch of the arrangement of shrubs, trees, flowers, grass.</p> <p>Compare the city schoolground with the country schoolground. Account for differences. Try to think of ways in which the ground you observe can be improved.</p> <p>Compare with your own school ground. Try to think of ways in which the ground you observe can be improved.</p> <p>Make list of trees observed at different times. Record the state of health of the trees from time to time.</p>	<p>Get permission to plant a shrub or tree at home. Study the present landscaping and decide what kind of new plant would be most effective.</p> <p>Plan ways in which the landscaping of your grounds can be improved. Get permission to plant a few trees or shrubs.</p> <p>Plan ways in which the landscaping on your ground can be improved. Get permission to plant a tree or shrub on your ground.</p> <p>Learn whether or not the forest trees observed are native to the locality. Learn whether or not the locality ever was forested and, if so, why and when it was cleared.</p>
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Trees and Forests—Continued

Where to go and what to see	What to do	Further activities
<p>Lumber yard:</p> <p>Amount of lumber on hand.</p> <p>Kinds of wood.</p> <p>How preserved.</p> <p>Waste.</p>	<p>Make list of kinds of lumber.</p> <p>Examine types of lumber and note qualities of different types.</p> <p>Ask the dealer for what uses the different types of lumber are sold.</p> <p>Learn where the lumber is secured.</p> <p>Ask for small specimens of different kinds of wood.</p>	<p>Observe the lumber which is used in the community for building and other purposes.</p> <p>Learn about other building materials which can be substituted for lumber.</p> <p>Arrange and label a display of the specimens of wood collected.</p>
<p>A sawmill:</p> <p>Methods of sawing logs.</p> <p>Ways of preventing waste.</p> <p>Methods of conserving future supply.</p> <p>Kinds of trees logs were cut from.</p>	<p>Ask for specimens of lumber.</p> <p>Ask where the lumber is sold.</p> <p>Ask about the uses made of the lumber you see.</p>	<p>Study about methods of lumbering and milling.</p> <p>Learn about conservation in the lumber industry.</p> <p>Learn what lumber companies are doing to conserve the forests and find out what difficulties they have in practicing methods of conservation.</p> <p>Write to lumber companies for pictures and make a collection of pictures about forests and the lumber industry.</p>

Birds

Meadows, brooks, fence corners, and the like:

- Kinds of weed seeds eaten.
- Insects which birds appear to eat.
- Grain or fruit which birds eat.
- Ways in which birds can be protected.
- Shrubs or vines which protect birds from enemies.

Weeds and bushes:

- Nests.
- Loose feathers.
- Eggs.
- Nesting habits.
- Care of young.
- Adaptation to environment.

* See also pages 12-17.

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| <p>Observe birds with field glasses.</p> <p>Note weeds or plants apparently stripped of seeds.</p> <p>Observe birds closely to note whether they eat fruit, grain, or insects.</p> <p>Gather specimens of shrubs or plants that provide shelter or food.</p> <p>In spring, look for new birds. Look about also for signs of spring that call the birds from their winter homes back to your community.</p> <p>In autumn, look for signs of winter which drive many birds south.</p> | <p>From the U. S. Government Printing Office secure Government bulletins on the habits of the birds observed.</p> <p>Compare observations made with information given in the bulletins.</p> <p>Plan ways of protecting birds in fence corners or in fields.</p> <p>Write to U. S. Biological Survey for information regarding the kind of plants useful for food and protection for birds of different species.</p> <p>Plan and keep a bird calendar.</p> <p>Keep a list of hawks observed in the community.</p> <p>Learn what they eat.</p> |
| <p>Gather feathers needed for study or display; not more than needed.</p> <p>Compare nesting habits of different birds.</p> <p>Compare nests of different birds.</p> <p>Compare eggs in size, color, and number.</p> <p>Take photographs of eggs in nest.</p> | <p>Plan a way of mounting collected feathers with short descriptions or interesting facts about the birds.</p> <p>Model eggs with clay to represent the eggs of birds.</p> <p>Make a bird exhibit.</p> |

Birds—Continued

Where to go and what to see	What to do	Further activities
<p>Birds: Woods to find nests of hawks and owls.</p> <p>Place where an eagle's nest was reported.</p>	<p>Listen to call of the hawk. Draw sketch of the nest. Determine whether or not young birds are in the nest. Observe the beauty of wings and graceful soaring of the adult bird. Note how sleepy an owl appears in the day-time.</p> <p>Note size of nest and its location high on a tree. Observe the swift flight of the adult birds.</p>	<p>Study the control of rodents and insects by predatory birds. Write to the Emergency Conservation Committee, 734 Lexington Ave., New York City, for teaching units on predatory birds. Write to State game commissioners inquiring about the value of hawks or owls and the protection given certain species. Discover why the eagle was chosen as our national emblem. Write to the State game commission and inquire about the protection afforded this noble bird. Study material on the food habits of the eagle.</p>

<p>Lake, stream, or marsh (especially during migration):</p> <ul style="list-style-type: none"> Kinds of birds seen. Nesting places (if any). Number of birds. Relation to man's "improvements." 	<p>Draw sketches of ducks and geese at rest in water or in flight.</p> <p>Count the number of different kinds of birds and record.</p> <p>Decide why wading birds possess long legs.</p>	<p>Plan posters and articles on the need for preserving our waterfowl.</p> <p>Influence a farmer or the community to set aside a sanctuary for migrating or resident birds.</p> <p>Care for the sanctuary, post "No hunting" signs.</p> <p>Arrange to feed migrating birds.</p> <p>Take occasional bird counts.</p>
<p>Bird shelters, feeding trays, or baths built by other children and neighbors:</p> <ul style="list-style-type: none"> Kinds of birds protected. Types of protection given. Kinds of food put out. Habits of birds. How undesirable birds are excluded. How cats and other animals are excluded. 	<p>Draw sketches of shelters or trays observed.</p> <p>Talk with persons who built the shelters and learn what work was involved.</p> <p>Make record of materials used.</p> <p>Gather ideas for attracting birds to home or schoolground.</p>	<p>Build a bird shelter on the schoolground.</p> <p>Build a feeding station and observe the birds from day to day.</p> <p>Put out feed for birds and make record of birds that eat it.</p> <p>Construct a bird bath and note the birds which use it.</p> <p>Build bird houses for the birds which come frequently to the school ground.</p> <p>Start a bird sanctuary.</p> <p>Begin a collection of bulletins and other materials about bird protection and make them available to the community.</p>

Birds—Continued

Where to go and what to see	What to do	Further activities
<p>Orchards frequented by birds:</p> <p> Kinds of birds.</p> <p> Amount of fruit taken.</p> <p> Insects in the orchard which birds might eat.</p> <p> Birds' nests.</p> <p> Accessibility of wild fruit, such as elder or mulberries for food.</p>	<p>Make record of things observed.</p> <p>Try to decide whether birds are harmful or useful.</p> <p>See if there is wild fruit or seeds available to the birds to save the cultivated fruit.</p>	<p>Write for Government bulletins about birds and learn what is known about the harmfulness or usefulness of different birds.</p> <p>Paint or print posters to interest people in conserving the birds.</p> <p>Write a manual to help children in lower grades identify birds of the community.</p> <p>Prepare a map, chart, or poster of birds which live in the community in summer and those which live there in winter.</p> <p>Estimate amount of fruit taken in a season.</p>
<p>Aviary in park or zoo:</p> <p> Birds of different kinds.</p> <p> Habitats.</p> <p> Historics.</p>	<p>Make record of birds observed.</p> <p>Learn what food the birds eat.</p> <p>Study what countries they come from.</p> <p>Study information given on signs and labels.</p>	<p>Compare information gained in park with that given in books or bulletins.</p> <p>Secure pictures of the birds observed and arrange them on a chart or in a scrap book and plan labels with interesting information and ways of protecting.</p> <p>Make a special study of hawks and water-fowl observed with attention to their economic value.</p>

Schoolground, homes, woods, meadows, and other places frequented by birds for purpose of identifying unfamiliar birds:

Color and marking.

Manner of flying.

Shape in flight and at rest.

Song.

Call.

Usual location.

Bird sanctuary:

Kinds of birds which are protected.

Provisions for protecting timid birds from starlings and sparrows.

Provisions for protection of waterfowl.

Museum:

Birds of the community.

Characteristic shape and color.

Habitat.

Nests.

Sketch shape of different birds flying and at rest.

Try to write notes of call or song.

Look for banded birds. If you find a banded bird injured or dead, notify the United States Biological Survey, Washington, D. C.

Make list of birds seen.

Make note of habits of birds.

Make sketches of shelters, bird baths, feeding trays, protective thickets, and other attractions for birds.

Note birds, such as hawks and waterfowl which are particularly threatened by civilization.

Take notes to aid in identification.

Prepare a scrapbook of sketches made.

Plan and write an identification manual.

Keep a calendar of birds observed for the first time.

Listen to a phonograph record of bird calls.

Carry on further study of birds seen.

Build shelters, bird baths, and feeding trays to attract birds to schoolground.

Write to the Bureau of Biological Survey, for mimeographed or printed information about its activities in bird-banding.

Study practical values of birds observed.

Study and practice ways of attracting them.

Observe motion pictures showing birds in flight and in action (limit study to birds observed on trip).

Birds—Continued

Where to go and what to see	What to do	Further activities
Bird haunts at dawn (for individual pupils): Identify birds. Listen to their songs and calls.	Make sketches or take photos of birds in flight or at rest.	Make individual scrap-books of special trips.

Fish

A fish cannery in the neighborhood: Kinds of fish. Methods of catching. Methods of preparing and canning. Waste.	Write notes to help in making report to classmates. Ask the manager or your guide what efforts are made to prevent waste of fish and to maintain the supply every year.	Write to other canneries for information about the canning of fish. Ask your grocer to save labels from different brands of canned fish for you. Study about the different places which supply the Nation's supply of canned fish. Plan an aquarium for the classroom.
A fish hatchery: Kinds of fish. Source of water. Efforts to prevent disease. Use of fish hatched.	Ask the manager to help answer your questions about the hatchery and the fish. Learn where the fish are sold and for what purposes.	Prepare a report for classmates unable to take the trip. Prepare a map to show where the fish are sold.

Minerals¹

Oil field or natural gas field.
How oil is transported and stored.

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Refinery:

Methods of purifying products.

Gasoline service station.

Interview resident manager of one company's section.
Ask him to guide children through a part of the field (make arrangements beforehand).

Arrange with a company's public relations man to guide children through plant.

Request the attendant to show the class the different kinds of oil and gasoline.
Watch a car being greased, count the number of points that need attention.
Take some small glass tubes or bottles (used perfume bottles) and collect a sample of each product.

Collect data on field:
When discovered.

How owned or leased.

Depths of wells.

Annual production.

Conservation methods practiced.

Probable life of field.

List the by-products of petroleum.

Draw a diagram showing the relation of these products to each other.

Have two or three of the group make a report on the trip.

Request the company to loan a display or if possible give a sample of each of several products.

Arrange a display of petroleum products.

Collect information and descriptive material on oil and natural gas. Use this as a basis for making posters and writing articles for school or local newspaper on the need for conserving oil and gasoline.

¹ See also pages 5 and 6.

Minerals—Continued

Where to go and what to see	What to do	Further activities
<p>Scrap yard:</p> <p>Wastage from rust.</p> <p>Articles made from iron.</p> <p>Articles of other minerals.</p>	<p>Compare painted iron with unpainted iron with respect to damage from rust.</p> <p>Note other ways of protecting iron.</p>	<p>Hold a scrap-iron sale.</p> <p>Obtain light truck or cars to carry iron to school yard or dealer for sale.</p> <p>Have class meeting to discuss the things the children can do to save iron.</p>
<p>Coalyard:</p> <p>Kinds of coal, sizes, and varieties.</p> <p>Weighing of coal on trucks.</p> <p>Transporting of coal.</p>	<p>Gather samples for display.</p> <p>Find out where different kinds of coal came from.</p> <p>Find fossils in coal to show that its origin was organic.</p>	<p>Arrange specimens in a display and label.</p> <p>Locate coal deposits on map (write to U. S. Geological Survey, Washington, D. C., for information).</p> <p>Collect information on remaining coal deposits.</p> <p>Collect information on the care of coal fires.</p> <p>Make some posters on the need for conservation of coal.</p>

<p>Quarries: Type of stone. Methods of cutting. Waste.</p> <p>A roadside or creek with many pebbles: Shape of stones. Variety. Location of larger and smaller pebbles.</p>	<p>Gather specimens for display. Interview the manager of the quarry and learn for what the stone is used. Learn to what extent the supply of rock in the quarry is exhaustible.</p> <p>Try to determine possible source of pebbles. Decide how they were moved to their present location. Make a collection of interesting pebbles.</p>	<p>Arrange specimens in orderly display with carefully planned labels. Learn what other substances can be used as substitutes. Learn what ways labor and cost in extraction might be saved. Write the imaginary story of a pebble which was first washed out of a tiny gully.</p>
<p>Historical churches and other buildings: Architecture. Material. Decoration. Pews of famous men. Neighborhood. Organization responsible for establishment and maintenance.</p>	<p>Make sketches. Read inscriptions. Take pictures or buy postcard views.</p>	<p>Study history of the church and of the Nation as related to the church. Write a booklet about the church for the school library. Write a guidebook of the community's historical buildings and exhibit this in the town or school library or on a counter in a store.</p>

History and Culture

* See also pages 28 and 29.

History and Culture—Continued

Where to go and what to see	What to do	Further activities
Monuments: Lines, proportion, and general beauty. Appropriateness of design for the event commemorated. Location and use. Condition.	Learn name of artist. Read inscriptions, take notes, and write down questions to aid in study. Learn authorities responsible for maintenance.	Write an account of the historical significance of the monument. Make a book about the historical monuments of the community and the historical importance of the events they commemorate. Write to National Park Service, Washington, D. C., for information about historical landmarks in the national parks.
Historic homes: Material. Architecture. Furniture. State of repair.	Imagine life in such a home with only the conveniences shown. Discuss ways of using utensils and furniture.	Make an imaginary drawing to show an activity in the home in early days. Write a booklet about the historical homes of the community. Learn what United States history is associated with the homes. Learn whether or not there is anything the school can do to keep the building or grounds in better repair.

<p>Historic trees: Kinds. Source, whether native or not. Condition. Inscriptions.</p>	<p>Make sketches. Discuss history. Write questions for investigation.</p>	<p>Learn the age of the trees. Learn about their history and the events which they commemorate. Learn what community group is responsible for their preservation.</p>
<p>Museums: Different kinds of exhibits. Architectural beauty of these buildings. Organization responsible for maintenance. Condition of buildings and exhibits. Local handicrafts: Furniture. Rugs, carpets, coverlets, and the like. Metalcrafts. Pottery. Embroidery. Block printing. Local literary relics: Homes of writers. Collections of writings in library.</p>	<p>Give attention to exhibits of particular interest to the unit of study. Take notes of information useful for study.</p> <p>Observe different articles from standpoint of design, material, and points of special beauty.</p> <p>Sketch homes. Make list of writings. Note bindings of books. Note illustrations.</p>	<p>Learn to what extent the museum is used by the community. Plan what the school can do to increase the community's interest in the museum.</p> <p>Plan way of participating in the making of some article. Ask a local craftsman to visit the school and teach the pupils something about the craft.</p> <p>Read stories or poems.</p>

History and Culture—Continued

Where to go and what to see	What to do	Further activities
<p>Early skills:</p> <ul style="list-style-type: none"> Soapmaking. Churning butter. Cheesemaking. Drying of fruit. Candlemaking. Quilting. <p>Old-fashioned vehicles and machinery:</p> <ul style="list-style-type: none"> Spring wagon. Buggy. Sleigh. Carriage. Cider press. Corn sheller (hand). Grindstone. Spinning wheel. <p>Local people who pursue interesting hobbies:</p> <ul style="list-style-type: none"> Stamp collections. Collections of antiques. Collections of interesting books. 	<p>Visit homes where such activities are carried on.</p> <p>Ask parents for recipes and sets of directions for doing the work.</p> <p>Note materials of which objects are made.</p> <p>Note the power that moves them.</p> <p>Note the large amount of man power required to use them.</p> <p>Ask questions.</p> <p>Be careful and appreciative when viewing other people's possessions.</p>	<p>Invite one of the parents to teach the children an early skill.</p> <p>Plan demonstrations for other classes.</p> <p>Develop a study of home life in early days of the community.</p> <p>Select hobbies and pursue them.</p> <p>Make a study of articles in collections of special interest.</p>

<p>Gardening. Raising of fancy animals. Quilts and quilt patterns.</p>	<p>Study about plants or animals of special interest to their owners. Read about interesting hobbies of famous people. Plan a rug or quilt to be made in school.</p>	<p>Sketch patterns and designs with view to making further study of them.</p>
<p>Cemeteries: Interesting tombstones. Inscriptions on tombstones. Condition of cemetery and tombs of famous people.</p>	<p>Learn who is responsible for the cemetery's maintenance. Study about the historical periods in which important local people lived. Learn what social contributions were made to the community's culture by the early people no longer living.</p>	<p>Read and discuss inscriptions in which pupils are interested. Copy inscriptions.</p>
<p>Headquarters of patriotic associations such as the American Legion or Daughters of the American Revolution: Exhibits of pictures. Displays of flags. Collections of records.</p>	<p>Learn history of the collections. Try to find ways of contributing to the collections. Invite members of the association to come to the school to speak.</p>	<p>Note care given to displays. Read labels. Discuss points of interest.</p>

History and Culture—Continued

Where to go and what to see	What to do	Further activities
<p>Local sources of Indian crafts:</p> <p>Old battlegrounds or other sources of arrowheads.</p> <p>Indian mounds:</p> <p>Pieces of pottery.</p> <p>Arrowheads.</p> <p>Objects made of silver.</p> <p>Polished stone.</p> <p>State or local museum:</p> <p>Baskets.</p> <p>Pottery.</p> <p>Beads.</p> <p>Pieces of copper, silver.</p> <p>Polished stone.</p> <p>Shells.</p> <p>Drums.</p> <p>Rocks with symbols of Indian writing.</p> <p>Toboggans.</p>	<p>Collect a few specimens for school exhibit.</p> <p>Note designs and material.</p> <p>Try to understand meaning of the design you see.</p> <p>Sketch designs which are particularly appealing for use in some of your own art work.</p> <p>Copy symbols of Indian writing and compare with other pictorial writing which class has studied.</p> <p>Jot down questions for investigation.</p> <p>Make sketches of objects for reproduction.</p> <p>Secure free bulletins or folders of information.</p>	<p>Imagine yourself an Indian in your community and make a piece of bead work, basket, or a rug using a design to express the way you feel about nature or some part of your tribal culture.</p> <p>Write to State anthropologist or museum to learn where in your State to dig for Indian relics such as arrowheads, pieces of pottery, etc.</p> <p>Learn how to make Indian headwear such as that worn by Indians in your community.</p> <p>Learn how to make drums such as the Indians in your community made.</p>

<p>Quarries used by Indians: Clay for pottery. Clay from which Indians in some communities made their pipes. Fields or woods: Plants which Indians used for dyes, food, or medicine. Indian camps in the community: Food prepared by the Indians. Indian dance.</p>	<p>Note color and texture of the clay. Note the useful parts of these plants whether flower, leaves, or root. Gather a few plants for a collection. Observe an Indian dance. Ask an Indian woman to tell tribal legends.</p>	<p>Make a list of local names of Indian origin. Make an Indian toboggan.⁷ Organize and label collections of Indian relics, statuary, and pictures of Indians who once lived in your community. Make a piece of pottery similar to that made by Indians who once lived in your locality. Press and label the plants gathered. Learn what plants the Indians used for dyes and how they prepared the dye. Prepare dye as the Indians did. Imagine yourself an early Indian of your community and tell the class a legend. Imagine yourself an Indian and compose a dance commemorating some event in the history of your tribe.</p>
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⁷ Salomon, Johan H. The book of Indian crafts and lore. New York, Harper and Brothers, 1928. 418 p.

History and Culture—Continued

Where to go and what to see	What to do	Further activities
<p>Original homes of neighbors of other nationalities:</p> <ul style="list-style-type: none"> Weaving. Costumes. Embroidery. Basketry. Furniture. Cooking utensils. Tools. <p>Library:</p> <ul style="list-style-type: none"> Exhibits of rare and old books. Records such as documents, laws, reports. Paintings. 	<p>Learn how work was done.</p> <p>Ask questions about interesting ways of living in the homeland.</p> <p>Ask for loan of duplicate articles for exhibit in school.</p> <p>Try to learn interesting facts:</p> <ul style="list-style-type: none"> How old. Author. Subjects. How printed and illustrated. <p>Where are other copies besides in this library.</p> <p>Style.</p>	<p>Study about the homeland of the neighbors visited.</p> <p>Prepare exhibit of household articles used in the homelands of European or other nationalities.</p> <p>Make a collection of old books people are willing to lend.</p> <p>Arrange an exhibit, comparing with modern books on same subject.</p>

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