

CONSERVATION IN THE EDUCATION PROGRAM

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FOREWORD

OF THE many major social problems with which we are confronted today, conservation of our natural resources is among the most significant. Probably at no time in our history has there been as much concern as now about the havoc which ruthlessness in the use of our resources has made in the wealth with which this country was originally endowed. The Federal Government is spending millions of dollars annually in such conservation activities as are carried on by the Forest Service, Resettlement Administration, Tennessee Valley Authority, the National Park Service, Soil Conservation Service, and other Federal agencies in an effort to remedy the disastrous effects of years of neglect and exploitation.

A number of voluntary organizations such as the Wildlife Institute, Educational Conservation Society, American Forestry Association, American Nature Association, etc., are devoting their efforts to the stimulation of a more nearly adequate appreciation of the place conservation holds in our national life. It is more and more generally realized that we need intelligent action toward a Nation-wide, effective, permanent program in conservation. Organized public education offers the best, if not the only, means of ultimately and fully accomplishing this purpose.

The schools throughout the country have made progress in introducing conservation into the curricular program and in adapting the technical knowledge now available to classroom use. The purposes of this bulletin on "Conservation Education" are first to provide school officials and others interested with information concerning progress so far made in introducing conservation into the school program, and, second, to stimulate further progress through a description of instructional practices which have been successfully followed in a number of school systems.

J. W. STUDEBAKER,
Commissioner of Education.

CONSERVATION IN THE EDUCATION PROGRAM

CONSERVATION A NATIONAL POLICY

THE UNITED STATES contains within its borders a wealth of diversified raw materials, a variety of soil and climate, vast resources in forest and mineral deposits, which since the early years of the Republic, pioneers have drawn upon with a lavish hand.

"A nation less bountifully endowed than ours", said President Franklin D. Roosevelt in his dedication address at the new Department of the Interior Building, "would have ceased to exist a long time ago. The remarkable thing was that the people of the United States were complacent for so long in the face of exploitation and waste and mismanagement, yes, and even larceny, of the national wealth that belongs to all the people."

Some conception of the conditions which have led to the need for conservation is essential to an understanding of its significance in our national life. Nature undisturbed maintains a balance of processes, which in effect is conservation, providing for, protecting, adjusting, and substituting when this balance is disturbed. After a forest fire new growth springs up. A water supply diverted may encourage the growth of a plant which resists arid forces. A fault on a hillside resulting in a disturbance of land may soon be healed over by plants which cling tenaciously to rocky ledges. The need for conservation arises because man disturbs this balance of nature. For example, he irrigates the desert; dams the streams; tills the soil and raises new and different crops; cuts the forest; removes minerals; diverts streams; plows the field; builds cities; kills game; pollutes the streams; removes fish; destroys birds. Even without waste, civilization affects land, stream, and forest, and adjustment must be made between the

needs of society and the elements essential for satisfying these needs.

This balance in nature is referred to by Paul V. Sears in his *Deserts on the March* when he says:

The picture, then, of the continent undisturbed by man is one of the most abundant life possible. Forests extend far inland and the grass extends beyond them to its utmost possible limits. Deserts are shrunken to their least possible compass under the existing climatic conditions. In the midst of this order there is, of course, no absolute uniformity. Hilltops are drier and more exposed than valleys and ravines, although if it were not for the constant shiftings of the earth's crust the hills would be cut down and the valleys slowly built up. Within each province the drier and more exposed situations tend to have those kinds of vegetation which would occur in valleys farther inland. For example, the bur oak, which grows in stream valleys in Nebraska and Oklahoma, grows on very dry hilltops in Indiana. The shorter grasses which are found in eastern Colorado are also found on the drier hilltops in central Kansas. But here again the course of nature has its effect and as time goes on the pattern of vegetation in any place tends to become more and more uniform and appropriate to the climate. Even on the hilltops there is some accumulation of humus which makes possible to a considerable extent the upward climb of valley plants. Just as the desert in the interior comes to occupy the least possible space, so do the drier types of vegetation within each area.¹

The apparent confidence that the resources of America were unlimited, or practically so, which prevailed until recent years, is responsible for the fact that waste as well as use depleted our natural resources over a long period of years. For example, it is estimated that two-thirds of the forestry products have been wasted in the past and that we lose approximately 50 millions of dollars each year through soil erosion. Great losses have taken place in connection with mineral resources. In coal mining, for example, it is estimated that we waste 1½ tons in producing one ton; that four barrels of oil are wasted in producing one barrel, and that as much natural gas is wasted as is produced.²

Wildlife depletion has resulted in the complete extinction of

¹ Sears, Paul V. *Deserts on the March*. Norman, Okla., University of Oklahoma press, 1935. 231 p.

² Goslin, Ryllis A., and Goslin, Omar P. *Rich man, poor man: Pictures of a paradox*. New York, Harper and brothers, 1935. p. 71.

many species, among them the wild pigeons, which, as late as Audubon's time, were numbered in the millions in the United States. Besides many species of birds, at least 11 species of wild animals are now reported extinct.³ Seals recently on the verge of extinction are now protected by international agreement.

Fortunately, through awakened public opinion and governmental activity, a Nation-wide conservation movement is under way. "We are now devoting our energies", according to President Roosevelt,⁴ "to the conservation of our God-given wealth. Employing every agency of the Government at hand to protect our birthright we have in the past several years made advances far beyond the hopes of earlier-day conservationists. But the battle goes on, and, as in the case of other battles, it is a battle against the law of opposition. That battle must be carried forward with renewed vigor if future generations are to receive the full benefits that are their due."

During the administration of Theodore Roosevelt as President of the United States, the Government became active in conservation of natural resources. Forest conservation was one of the first Government activities and has received increasing attention during the years since its initiation. Replenishment is now actively under way through the development of forests, forest fire protection, restoration of devastated lands, forestry education, regulatory legislation, and research and experimentation.

Soil and water conservation offer other important examples of Government activity. Water is recognized as of primary importance in any conservation program. It is essential for domestic use, transportation of waste, irrigation and food production, water power, recreation; navigation, etc. The whole program of conservation is interlocked with water conservation, forest preservation, soil cultivation and erosion, canals, levies, and the like.

At the present time the Federal Government is directing several large scale efforts for the purpose of preserving and rebuilding the national resources of our country. Among the most extensive of these undertakings at the present time are those concerned with land reclamation such as the Boulder Dam project; with con-

³ Science magazine, Nov. 8, 1935.

⁴ Address delivered at the dedication of the new Department of the Interior Building.

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servation of water, power, soil, etc., such as the Tennessee Valley undertaking; projects directed toward flood control, oil conservation, reforestation, and afforestation; and projects designed to conserve our coal and other mineral supply. In promoting such a program our Government is following an example set by European countries—Germany, Sweden, France, Italy—all of which antedated us by a long period of years in following definite programs of conservation, particularly of forests and generally of soil productivity and waterways.

The Government alone, however, cannot accomplish the full purpose of conservation unless it is accompanied by an effective program of education on a Nation-wide scale, reaching citizens of all ages, children and adults, on whose understanding and cooperation in the final analysis the future preservation of our resources depends. Such a program can best be undertaken by—indeed, is even now under way in the schools of the country. Organized public education has long been society's instrument for conserving human resources. It can well find in the urgency of this Nation-wide problem, a primary reason for extending its instructional services into this newer field of conserving the Nation's material resources. Moreover, from the point of view of both practical and spiritual values, conservation merits a place in the school program, a point of view adequately stated by Secretary Ickes in an address delivered for the Education Conservation Society, February 17, 1934:

It ought not to be necessary to argue that our children in the schools should be taught the importance from a practical point of view of making a wise but nevertheless selective use of the bounties of nature. It ought also to be taken for granted that their education would not be complete if they did not learn from those competent to teach, the spiritual qualities that abide in mountain, stream, and plain. I am sure that many will agree with me that those schools which fail to furnish the instruction and the inspiration that comes from an intelligent consideration of the subject of conservation, are in reality as backward as the log schools of our great grandfathers, however advanced they may think they are.

It is, however, in the importance of conservation as a current social problem that major justification of its introduction into our elementary and secondary school curricula is established. That

school systems have accepted their responsibility to a considerable extent will appear later in this bulletin. Two States—Wisconsin and Florida—have enacted legislation recently requiring instruction in conservation in the schools. However, it is through professional rather than legal interest that real progress may be expected. Improved practices and extension of conservation education wait on the preparation of materials adapted directly to school use especially on the elementary and secondary levels. There is undoubtedly a wealth of technical material which can and should be organized in form suitable for classroom instruction and made available to school officials. In the meantime superintendents and teachers are making progress both in the collecting of material on conservation and in its preparation for school use. So far, progress in this direction has been confined largely to local needs and problems, an excellent point of departure, as well as to favored localities. The work needs to be greatly expanded, vitalized, and integrated to the end that pupils in the schools have a clearer realization of their responsibilities and opportunities in conserving wildlife, forests, land and soil, oil, and minerals, as well as the place of conservation in the important fields of human health and human life.

The report of the National Resources Board of December 1, 1934, gives a forward-looking meaning to conservation, which is of special interest to those responsible for incorporating the subject into an educational program:

The natural resources of America (United States) are the heritage of the whole Nation and should be conserved and utilized for the benefit of all of our people. . . . To some extent, the shameful waste of our timber, oil, soil, and minerals has been halted, although with terrible exceptions where ignorance, inattention, or greed has devastated our heritage almost beyond belief. . . . Man's achievements in the physical sciences, and in the arts of communication, transportation, and mechanized production, have led to the frequent assertion that he has conquered nature. This assertion is too sweeping. Civilization is not an enslavement of a constant and stable earth. Man does not conquer the earth but strives to enter into harmonious relationship with it. . . . In some instances nature's ways have been so modified by inadequately planned works of man that now engineering and economic experience indicate the need of readjustment in respect to many of these relations; in some aspects a more intelligent conformity to certain basic, inexorable conditions imposed

by nature; in other aspects a more *intelligent utilization* of her generous gifts.

The natural resources of our country are like moneys in the banks. They may be:

- (a) Hoarded without benefit to commerce.
- (b) Expended injudiciously, resulting in economic chaos.
- (c) Used to enrich a few at the expense of many.
- (d) The primary cause of national and international strife.

OR

- (a) "Developed" for the benefit of commerce.
- (b) "Distributed" according to "economic laws."
- (c) Considered, so far as possible, the heritage of all the people.
- (d) Used in such a way as to alleviate, if not abolish, national and international strife.

Upon the solution of these problems depends the spiritual as well as the material welfare of the people of the United States.

CONSERVATION AND THE SCHOOL PROGRAM

THE introduction of conservation as a subject or activity into the school program involves important considerations.

First, the materials of instruction must have genuine scientific authenticity.

Second, they must be organized for school use by professionally trained and experienced curriculum specialists in conformity with State and local curriculum offerings.

Third, instruction in conservation must find its way to the pupils through the regular channels provided by State and local educational agencies.

An examination of recent courses of study indicates that different practices prevail for the introduction of conservation into the school program. Instruction may be accomplished through integration with certain major aspects of the existing program; it may be introduced as a separate subject; it may appear as a series of topics in one or more of the social studies; or it may be taught wholly through activity or experience units related to or independent of other school subjects or activities. These and other examples that might be cited of the variety of practices among schools and school systems both in materials and methods indicate the need for research and experimentation concerned with successful practices, with suitable materials, and with effective means of incorporating the materials into school curricula.

The relation of extracurricular and out-of-school activities to a program of education for conservation needs investigation and study. It is evident that various kinds of school organizations such as the Future Farmers of America, School Boy Patrols, clubs enlisting the hobby interests, the nature interest, and other interests of children and youth, can do a great deal in teaching prevention of fires, the protection of wildlife, and similar essentials of a program of conservation. Correlated studies and reports of how agencies auxiliary to the schools such as the Camp Fire

Girls, Boy Scouts of America, Girl Scouts, 4-H Clubs, and other youth organizations, can contribute to a program of conservation education, would do much to unify present efforts and coordinate activities. These organizations are already interested in such educational experiences as field trips, camping trips, week-end hikes and excursions, all of which provide excellent opportunities for appreciation of conservation problems and their solution.

Adult education programs more recently developed in connection with our systems of education, such as public forums, adult classes, community programs in dramatics, debating, hobbies, etc., can contribute to the solution of the problems of conserving natural resources, and they offer an important opportunity to develop community awareness and appreciation of conservation. It would seem that while governmental and private agencies are engaged in the terrific and somewhat disheartening struggle to repair by direct methods the damages which have been done to our forests, lands, streams, and wildlife through the ignorance and indifference of our citizens, provision for a program of adult education through which there can be put quickly into the minds of millions of people the challenge to conserve what we have left and to rebuild our lost fortunes, would be the most profitable of all investments.

Another aspect of a complete program in conservation education is teacher education. Both in-service and pre-service courses should be available if school instruction is to be effective. An excellent example of an effective plan for in-service education of teachers is that recently adopted in a number of States through revision of courses of study on a State-wide scale. Teacher-education institutions, school administrators, supervisors, and teachers, worked together through local and regional committees under the direction of the State department of education and with the supervision and advice of technical consultants in studying objectives, procedures, problems, and in preparing materials for the revised courses. The plan is suggestive, if not directly applicable, as a possible procedure for in-service education in conservation.

In summary it appears that the importance of conservation education to our social, economic, and political life is such that it should be made an integral part of the program of instruction.

In incorporating conservation into this program the following guiding principles may be helpful:

1. Conservation cannot be adequately taught through a single unit or a series of single units in this field. While for purposes of emphasis it may be desirable to develop such units, it is only as the concepts of conservation are made a fundamental part of curriculum planning that the subject can be adequately treated.

2. The materials of conservation education lend themselves effectively to curriculum planning. Conservation forms one of the major themes which may appropriately be considered in curriculum construction.

3. The materials available in the field of conservation from both private and governmental sources provide basic material to be developed and organized for instructional purposes.

4. In developing a program of conservation education it is important to consider the various aspects of conservation, but such consideration should by no means narrow the view of this subject for the pupils. It is important that the whole problem be approached in the large.

5. Conservation education cannot appropriately be confined to any one subject or field. Its understanding and appreciation come best through a knowledge of materials in several fields including economics, science, civics, agriculture, home economics, and geography.

6. The primary concepts of conservation can be understood and appreciated in their elementary form by very young children.

7. In developing a curriculum in conservation education its larger concepts should be dominant and such aspects as the study of wild flowers, the protection of game, the proper utilization of mineral resources should be presented as elements in the development of a complete program.

REPRESENTATIVE PRACTICES IN CONSERVATION EDUCATION

PRACTICALLY all State courses of study, and many local courses, provide at some point for bringing the child into contact with nature and introducing him to the social and economic aspects of conservation, though in relatively few have efforts been made to emphasize this aspect of contemporary life in unified fashion. There are, however, many examples of curricular practices which are suggestive and helpful to school officials and others interested in conservation education.

In general, conservation is taught in connection with another regularly established school subject such as: Elementary science, natural science, nature study, the social studies, particularly geography. In at least one State course of study, conservation is included among the major social functions or themes around which curricular materials are organized. A few States issue special bulletins or circulars on conservation education, while suggestive activity or experience units concerned with conservation are found in many courses of study, State and local.

A few examples of ways in which courses of study provide for education in conservation follow. No attempt has been made to survey all of the ways in which the subject appears. Rather are the examples which follow selected to serve as leads to those who desire to study the problem further or as suggestive of present practices to those interested in course of study provisions related to conservation.

RECOGNITION IN CURRICULAR ORGANIZATION

Certain recent State courses of study have developed a plan of organizing instructional materials around generalizations selected as useful in interpreting contemporary life. The Virginia State course of study illustrates an effort to analyze the major functions of life and to organize materials of instruction around these functions. Important functions were selected as follows: Pro-

tection and Conservation of Life, Property, and Natural Resources; Production of Goods and Services and Distribution of the Returns of Production; Consumption of Goods and Services; Communication and Transportation of Goods and People; Recreation; Expression of Aesthetic Impulses; Expression of Religious Impulses; Education; Extension of Freedom; Integration of the Individual; Exploration.¹

Virginia

The social functions approach to the formulation of a course of study as interpreted in the Virginia State course is based upon the theory that children should increase their understanding of the issues and problems of life and through this understanding develop the controls necessary for effective living. This theory also provides for an introduction to the major problems of life and assumes that the different school subjects contribute in one way or another to an understanding and appreciation of these problems. An essential element in the social functions procedure is the determination of the interests, abilities, and needs of children on various grade levels in order to map out a program which will result in learning on increasingly difficult levels, and in consequent cumulative achievement according to the planned program. The utilization of subject matter and method in relation to functional social problems corresponds with the theory that things should be learned in relation to the ways in which they will be used.

Two of the functions of social life referred to, i. e., the Protection and Conservation of Life, Property, and Natural Resources, and Production of Goods and Services and Distribution of the Returns of Production, relate directly to conservation education. The aspects selected for emphasis under each of these are shown in the following table:

¹ Caswell, Hollis L., and Campbell, Doak S. Curriculum Development, New York, American Book Co., 1935. p. 178.

Grade	Center of interest	Aspects selected for emphasis	
		Protection and conservation	Production of goods and services and distribution of the returns of production
1	Home and school life.	How do we work to maintain life and health in our home and school?	How do the things we make and grow help us?
2	Community life.	How do we, in the community, protect our life, health, and property? How do animal and plant life help people in our community, and how are they protected?	What do we do in our community to produce goods and services?
3	Adaptation of life to environmental forces of nature.	How do people, plants, and animals in communities with physical environment markedly different from ours protect themselves from the forces of nature?	How do environmental forces of nature affect the goods produced in different communities?
4	Adaptation of life to advancing physical frontiers.	How does frontier living affect the protection of life, property, and natural resources?	How does frontier living modify, and how has it been modified by the production of goods and services?
5	Effect of inventions and discoveries upon our living.	How do inventions and discoveries alter our ways of protecting and conserving life, property, and natural resources?	How do inventions and discoveries affect the variety and availability of goods?
6	Effect of machine production upon our living.	How does machine production lead to the conservation and to the waste of life, property, and natural resources?	How does machine production increase the quantity and variety and change the quality of goods?
7	Social divisions for cooperative living.	How do social and governmental agencies protect and conserve life, property, and natural resources?	Why are governmental monopolies established for the provision of certain services?
8	Adaptation of our living through nature, social and mechanical inventions and discoveries.	How and why do nature and agencies resulting from invention and discovery affect the protection and conservation of life and property?	How does man depend upon plant life, animal life, and minerals, and how do inventions and biological discoveries increase man's use and control of nature?
9	Agrarianism and industrialism and their effect upon our living.	How and why does the change from an agrarian to an industrial order affect the use and conservation of natural resources?	How does the change from an agrarian to an industrial society affect the production and distribution of goods and services?
10	Effects of changing cultures and changing social institutions upon our living.	Why is advancement in the protection of life and property essential in a changing society, and how can it be achieved?	How can we improve production, establish an economic balance between production and consumption, and provide for a more equitable distribution of the returns of production?
11	Effects of continuously planning the social order upon our living.	How can nations through social planning guarantee to all the protection of life, property, and natural resources?	How can nations plan for the establishment of proper economic interdependence by the apportioning of goods and services and by distributing these more equitably to the consumer?

NOTE.—Each of the nine additional major functions of life involves aspects selected for emphasis in each grade. The two functions listed above should not be considered apart from these other nine major functions, but are presented here primarily to show the place of conservation education in connection with the program presented in the Virginia course of study.

INCLUSION IN SOCIAL STUDIES AND SCIENCE COURSES

Conservation is included in courses of study in science and the social studies more frequently than in courses in other school subjects. New Jersey, Maryland, Pennsylvania, and New York are among the States issuing special courses in science in which topics concerned with the conservation of natural resources are included.

New Jersey

The New Jersey course of study in nature study and science² is organized around important concepts which are emphasized in the development of the various study units. The most important of these for conservation education are the following:

1. Life appears on the earth in a great variety of forms.
2. Certain life processes are common to all living things.
3. All forms of life react to their surroundings.
4. Living things are interdependent and not unrelated.
5. Life comes from life.
6. Living things reproduce their kind.
7. The young of living things tend to be like their parents.
8. Living things pass through periods of growth.
9. Successful living depends upon the application of laws of life and growth.
10. Man exercises a controlling influence on his environment.
11. Living things are greatly influenced by the sun.
12. Living things are dependent upon their available food supply.
13. Life has existed on the earth for long periods of time.
14. The earth is full of natural resources.
15. Erosion is largely responsible for soils.
16. Universal law and order control the natural world.

By setting up selected activities in the various grades the child is led through a series of experiences, many of which are related to the general theme of conservation, to an appreciation of the important problems connected with it. Little is said in this course of study, however, directly concerning the larger concepts of conservation except as they are included in the various outlines.

Maryland

An example of careful consideration of problems relating to conservation education is to be found in Science in the Elementary

² The Teaching of Nature Study and Elementary Science. Trenton, N. J., State department of public instruction, July 1929.

School, Suggested Units, Grades 1-7, issued by the State department of education of Maryland.³ This course emphasizes conservation under such units as:

GRADE 1. Behavior of plants and animals in winter; behavior of animals in fall and winter.

GRADE 2. How animals and plants supply us with food.

GRADE 3. Protection of animals and plants; value of trees; water and its work.

GRADE 4. Gardening.

GRADE 5. Use of science in agriculture; balance in nature.

GRADE 6. Forests and their protection.

GRADE 7. Life comes only from life.

Throughout these units ideas of conservation are developed, and a wealth of suggestive materials for discussion and conversation is included. Special consideration is given to such problems as conservation of coal and wood, forests, game, human energy, iron ore, natural resources, sea food, soil, water. Emphasis is placed also upon protection, including protection of animals, birds, plants, sea food, streams, soils, trees, and wild flowers. Each community has special problems in the field of conservation education. In Maryland an important phase of any program of conservation is that related to the oyster and the oyster industry. Consequently the course of study in conservation education deals with this problem. To assist in bringing about a general appreciation of its importance the conservation department of the State of Maryland has published a pamphlet on the oyster and oyster industry of that State.⁴ This bulletin presents interesting information concerning oysters and oyster culture and the conservation aspect of the oyster crop.

Pennsylvania

The Pennsylvania State Department of Public Instruction issues courses of study in science in which conservation receives

³ Baltimore, Md., State department of education. Maryland school bulletin, vol. 15, no. 1, September 1933.

⁴ Truitt, Reginald V. The oyster and the oyster industry of Maryland. Baltimore, Md., State of Maryland conservation department, 1931. (Conservation bulletin no. 4, April 1931.)

definite attention.⁵ The following outlines are quoted, as illustrative of the procedure followed in that State:

CONSERVATION OF WILDLIFE AND PLANTS

A. PROBLEMS AND EXPERIENCES

1. To consider changes in animal, bird, and plant life due to destruction by man.
2. To determine the characteristics of a good sportsman.

B. SUGGESTED ACTIVITIES

1. Story of extermination of the bison as an example of the extermination of animals.
2. Story of the extermination of the passenger pigeon as an example of the extermination of birds.

For the teacher: The following information respecting the passenger pigeon is taken from the Classroom Teacher, Vol. 8, p. 267, The Classroom Teacher, Inc., Chicago, Ill.: "In North America, within the last hundred years, six species of birds have been completely exterminated. The Great Auk, the Eskimo Curlew, the Passenger Pigeon, the Labrador Duck, the Pallas Cormorant, and the Carolina Parakeet have all disappeared before the direct attacks of man. The story of the passenger pigeon is the most spectacular, because not more than 50 or 60 years ago there were untold millions of these birds. In 1869, one Michigan town shipped 11,880,000 pigeons in 40 days. Another Michigan town shipped 15,840,000 dead birds in 2 years. The birds were shot, netted, and clubbed, and, though their numbers ran up into the millions, today not one passenger pigeon survives. Can we learn from this and other similar experiences to protect our wild life? Apparently not, for even now at least 30 species of birds are threatened with extinction and probably have not been seen by any member of your class anywhere except possibly in the zoo. The list includes the Whooping Crane, the American Flamingo, the Scarlet Ibis, the Upland Plover, several species of Sandpipers, the Wood Duck, the Heath Hen, the Sage Grouse, and others."

3. Pupils ask their grandparents for names of birds and animals that were common when they were small boys and girls, that have entirely or almost entirely disappeared from the neighborhood.

⁵ Commonwealth of Pennsylvania. Department of public instruction. Courses of study in science, grades four, five, and six. Harrisburg, Pa., the department, 1932. (Bulletin 72 A.) pp. 36-37.

4. Discuss reasons for establishment of State game preserves and bird refuges in Pennsylvania; locate nearest such refuges. (Pennsylvania Board of Game Commissioners, Bul. 9, A Year's Program for Bird Protection in Pennsylvania.)
5. Discuss noted game preserves and bird refuges in other parts of country; for example, the Bok bird refuge in Florida (World Almanac, 1929).
6. Individual pupils report bird or game refuges which they have visited.
7. Discuss reasons for scarcity of plants and flowers that are listed as needing protection in Preservation of Wild Flowers in Pennsylvania, published by the Pennsylvania Department of Agriculture, Harrisburg, Pa.
8. Discuss the following questions:
 Why has the State legislature made laws for the protection of plants and flowers? (These laws are also included in Bul. 9, referred to above.)
 What is the duty of every good citizen who may see any person breaking this law?
9. Discuss the following Honor Code of the Woods and Waters prepared by a member of the Pennsylvania Board of Game Commissioners.

HONOR CODE OF THE WOODS AND WATERS

First of all, "play fair" with all outdoors. Be a real sportsman to all the world, whether man or beast or bird or flower.

Have a proper contempt for the killing of wildlife for sale, and refuse to buy wild game or trophies in the market; a true sportsman kills his own game, and then kills only for himself and family.

No matter how much fish or game the law allows as a bag limit, take no more than you reasonably need. Make your aim not merely to see how much you can catch or kill, but conservation and propagation for another day, both for yourself and for the generations yet to come. Fish are not all of fishing nor "meat in the pot" any great part of hunting.

Never pull wild flowers recklessly or to let them wither and be thrown away. Never be such a "poor sport" as to gather wild flowers for sale.

Never rob a bird's nest. It is both cruel and unfair.

Be careful never to do anything that may start a forest fire. It kills valuable timber that it will take many years to grow again. It spoils the beauty of the outdoors, and destroys the cover and protection for birds and wild animals. It often burns up the nests and young of birds, and even burns up young game animals.

Never fish or hunt on farm lands without the owner's permission. Never leave gates open, nor injure nor alarm the farmer's cattle, nor shoot near his house or his stock, nor take his fruit, nor trample down his crops. Not only respect the farmer's rights yourself, but report to him and assist him in bringing to justice any others who break the laws protecting these rights.

Never, under any circumstances, shoot until you see clearly what you are shooting at, and that you are in no danger of shooting any human being.

ObeY all laws, whether you think they are reasonable or not. Laws are "the rules of the game" that men have worked out by their experience in trying to live together in civilized society. Though you may think it would improve the game if some of the rules were changed, yet be sportsman enough "to play with the team" and "play by the rules of the game" till they are changed in the proper way.⁶

HELPS FOR THE TEACHER IN EVALUATING PROGRESS

1. Are pupils interested in the preservation of wild flowers and plants? Do you think they will report infractions of the laws respecting picking or breaking shrubs or flowers that they may observe?
2. Are any pupils in the class planning to camp in a State forest during the summer? Have any permanent camp sites in State forests been obtained as a result of the study of this topic?
3. Have any additional scientific helps for the home been added in the homes of pupils as a result of the study of this subject?
4. Were the pupils in the class interested in the *Honor Code of the Woods and Waters*? Do you think they will practice this code?
5. Examine the course of study in science for grade VII.
6. Are your pupils ready to take up the material in the course in science for the next grade? Do you feel that the study of science has stimulated the practice of desirable character traits?
7. Organize tests covering points covered during the year that you think the pupils in the class should know. Remove any difficulties that these tests may indicate.
8. Do pupils know the State bird? The State tree?

⁶ Desirable: Film: Wildlife Conservation, Pennsylvania Board of Censors, Harrisburg, Pa. Free.

REFERENCES

- COMSTOCK, ANNA, Handbook of Nature Study.
CRAIG, GERALD, Tentative Course of Study in Elementary Science for Grades V and VI.
CRAIG, GERALD and JOHNSON, GOLDIE M., Pathways in Science, Book VI, Our Earth and Its Story.
DOWNING, E. R.:
Our Living World.
Our Physical World.
DUPUY, WILLIAM ATHERTON:
Our Insect Friends and Foes.
Our Animal Friends and Foes.
Our Bird Friends and Foes.
Our Plant Friends and Foes.
GREEN, GEORGE, A Survey of Nature.
GRESS, ERNEST, Common Wild Flowers of Pennsylvania.
ILLICK, JOSEPH, Common Trees of Pennsylvania.

South Dakota

The South Dakota course in the social studies exemplifies the development of a social studies curriculum through the theme procedure.⁷ The following 5 themes are utilized in this course: (1) Interdependence; (2) Man's increasing control over nature; (3) Adaptation; (4) Population; (5) Democracy.

The relationship of the second theme, Man's Increasing Control Over Nature, to conservation education is shown by the following points of emphasis for each of the grades:

GRADE 4. Man's early control of the soil. How man has learned to control nature through the use of the sea. Control over nature gives leisure for culture.

GRADE 5. Availability of the natural resources of the earth for man's needs. Control over nature through the application of scientific knowledge and method.

GRADE 6. Improvement in standards of living through increased availability of the resources of the earth. Control over nature through the application of scientific knowledge and method.

GRADES 7 and 8. Control of nature through the use of fire, water, metals, animals, and the soil. Control through the application of scientific knowledge and method.

⁷ Social studies for the upper grades. Pierre, S. Dak., State department of public instruction, 1932.

Iowa

In many courses of study, problems and topics concerned with conservation are included in units of the social studies groups, particularly geography and history. Iowa's Guide for Teaching Geography in the Elementary Grades⁸ is an example of the practice indicated. The topics, especially in the early elementary grades, are concerned largely with conservation. A few examples from the table of contents will illustrate this procedure:

- Gathering seeds in the fall.
- How trees change in the fall.
- How some birds get ready for winter.
- How animals prepare for winter.
- How we get ready for winter.
- The sun in winter.
- Clothing we wear in winter.
- Animal shelter.
- Trees in winter.
- How the weather influences us in what we do (wind).
- How the weather influences us in what we do (rain and clouds).
- Our water supply.
- What the soil does for us.
- Farmers of low, wet plains.

Ann Arbor, Mich.

An outstanding example of development of materials in conservation education is found in Helping Children Experience the Realities of the Social Order,⁹ prepared for use in the Ann Arbor, Mich., public schools, and organized on the unit of work basis. The material is prepared for grades 7, 8, and 9 of the junior high school. The Ann Arbor schools own and operate an educational experiment station consisting of 215 acres of land located about 180 miles northwest of Ann Arbor. The property has the following features: A lake, considerable timber, dense swamp, wild animals, berries, wild hay, and some tillable land. It offers valuable opportunities for study, observation, exploration, and development of interest in conservation problems and topics. Among the units outlined for study in the pamphlet

⁸ Guide for Teaching Geography in the Elementary Grades. Prepared by Clara M. Wallace and Olive Pearl Ritter. Published by the State of Iowa, Des Moines.

⁹ Helping Children Experience the Realities of the Social Order. Ann Arbor, Mich., Public Schools, 1933. (Social Studies in the Public Schools of Ann Arbor, Mich., Junior High School.)

referred to are the following: Utilization of Natural Resources, 7A grade; Control of Production, 8B grade; Adjustment to the Region and Control of Distribution, 9B grade. Some idea of the type of materials included may be gained from the materials which follow, taken from the "Utilization of Natural Resources" unit, to the study of which a period of 6 weeks is assigned.

This unit deals with the utilization of all of those things that are generally known and listed as natural resources. Bernard Fernow¹⁰ defines them as:

1. Resources inexhaustible—land, water, air.
2. Resources exhaustible and nonrestorable—mines.
3. Resources restorable but liable to deterioration under private activity—game, timber, water-power.
4. Resources restorable, yielding increased returns under increased activity—resources which are the product of human labor, industry, and ingenuity.

SOCIAL JUSTIFICATION FOR THE UNIT

Forests, farms, wildlife, recreation, and water for power, irrigation, transportation, and personal use depend upon land. All kinds of business are related to and, in some measure, are based upon these resources, and, together with them, are related to social welfare. The use of land for agriculture which is best suited for forestry results in poverty for the individual and the community. Where there is no local income, the upkeep of schools, roads, and other public activities must result in a burden to some other section of the governmental organization. The farmer, too, needs a better understanding of land use in order to manage his property to the best advantage.

From the standpoint of personality growth and expansion, natural resources should be considered as personal resources. Conservation as it has become known to the general public has represented really a form of social materialism. In this unit, if the child is given free reign, it is hoped that the humanistic approach may bring out a more human social philosophy. In the end the child may see the world and the people as an internal whole.

RELATION OF THIS UNIT TO COURSES IN THE ELEMENTARY AND SENIOR HIGH SCHOOL

During the sixth grade social studies course, some time is given to the four major forest areas in the United States, viz, the Maine area, the Great Lakes area, the Georgia Pine area, and the Red-

¹⁰ Bernard Fernow. *Economics of Forestry*. New York, Thomas Y. Crowell and co., 1902. p. 10.

wood area. The pupils are also familiar with the demands for and shortage of lumber in different parts of the United States. Considerable time is given throughout the elementary grades to food, clothing, and shelter.

In the senior high school utilization of resources is dwelt upon indirectly in connection with the history courses. In chemistry and biology it is studied more extensively in regard to food values, plants and their uses, birds, and insects.

RELATION OF THIS UNIT TO RELATED JUNIOR HIGH SCHOOL COURSES AND OTHER SOCIAL STUDIES

Graphs, problems, and testing of materials are furnished by the mathematics and general science classes so that we may have some estimate of the supply, actual utility, and future possibility of our resources. From the practical arts department are obtained samples of woods to show grain, durability, need for veneer, etc.

The two guidance units in the eighth grade take up the problem of employment in the national and state forests. The unit "Fields of Invention" taught in the same semester with this unit bears a very direct relationship in that it brings out the principle of flexibility in the use of natural resources.

SUGGESTED APPROACH ACTIVITIES

1. Take a land utilization map of Michigan and distinguish between land which is wasted and land which is properly utilized.
2. Reports by pupils who have toured in the waste sections and describe miles of stumps and little or no activity.
3. Presentation by an expert of a display and lecture in behalf of the reforestation movement.
4. Visit the Saginaw Forest.
5. Review the history of the conservation movement and the legislation on this subject that has been passed by the national and State governments.

EXPERIENCES IN PLANNING AND SOCIAL ACTION

Out of the various solution activities naturally come group and individual interests so intense and pointed that they may easily carry over into social action. For the school to withhold its guidance at this point is to emasculate the entire proceedings. Certain "next steps" implying social action by the children well within their range of execution may be allowed to mature as a part of the work of the unit. Suggestions for this unit:

1. Children of Mack School might plan to landscape the west border of the school grounds and submit to the Board of Education plans for planting of trees and shrubbery in order to beautify the premises.

2. Children might plot out a small park on West Huron Street to contain a spring, a grape vine, a few trees, and a monument and thus keep alive the memory of the founding of Ann Arbor. Pupils to submit plans to city council.
3. Children and teachers might buy up some/waste land in northern Michigan, plant trees, and establish a camp for summer vacations.
4. Children might make a set of sign boards, which they could submit to the city council, for the protection of wild flowers, birds, and nondestructive wild animals.
5. Children might plan a community garden for the coming summer in the vicinity of the school.

◆ INSTRUCTION THROUGH SPECIAL CIRCULARS AND BULLETINS

Special bulletins or circulars are issued by State departments of education in a number of States devoted directly to instruction in conservation or prepared to promote special phases of conservation education such as studies in forestry, wildlife studies, suggestions for the observance of Arbor or Bird Day or of Conservation Week.

Wisconsin

The Wisconsin State Department of Public Instruction has issued two bulletins for schools on the teaching of conservation.¹¹ Bulletin no. 1 contains references, book lists, and sources of materials. Bulletin no. 2 suggests curriculum activities suitable to various grade levels. "Many of these", according to the author, "can be started in the elementary school and continued without duplication into the high school." Following are the outlines presented for four of the suggested units and activities.

BIRDS

Building bird houses and winter feeding stations.
 Erecting bird lures at home and at school.
 Learning the names and habits of local birds.
 The story of bird migration.
 What birds need protection to avoid extinction?
 What birds are most valuable to us for beauty? As insect eaters?
 For food?

¹¹ Conservation teaching helps and references, Conservation bulletin no. 1. Conservation units, projects, and activities, Conservation bulletin no. 2. Madison, Wis., State department of education.

Should you make collections of birds' eggs?
 What birds may be hunted because they do more harm than good?
 Animals that destroy birds—cats, turtles, snakes, etc. Homeless cats especially are a menace.
 Game birds—propagation, protection, control. Marshland, field cover, sanctuaries.
 State and Federal agencies and activities affecting birds.
 What organizations in your community are interested in bird conservation?
 Study of laws protecting birds and their enforcement. Changes needed.
 Collecting bird poems and pictures.
 Bulletin board committee—posters, etc.
 What good bird stories do you know?
 Scientific study of birds—adaptation of structure to function, classification, economic value, etc.
 What are flushing bars?
 Bird club activities—assembly programs, hiking, feeding in winter, protection in summer, bird calendar, etc.
 Junior Audubon Societies. Write for information, blanks, etc., to National Association of Audubon Societies, 1757 Broadway, New York, N. Y. The Association also maintains in Maine, during the summer, The Audubon Nature Camp for Adult Leaders. Open to teachers.

FORESTS

How many kinds of trees do you know? Can you recognize their wood? Leaves? Bark? etc.
 Lumbering—the story of lumber in Wisconsin, replacement of forests.
 School and town forests.
 State and national forests and parks.
 Visit to CCC camp.
 Trees for beauty—roadside and park beautification.
 Saving the slaughter of Christmas trees.
 Tree enemies—insects, rabbits, etc.
 State laws for forest control—State conservation department.
 State program for reforestation—State conservation department.
 Fire control in forests—build a fire and put it out.
 Forest rangers—service, personnel.
 Following forest trails—what to do.
 Raising trees from seeds—trade with the squirrels.
 Planting and transplanting trees—seedlings from the State department of conservation.
 Collecting tools used in forestry—museum.

Forestry club—hiking, woodcraft, talks by rangers.
Scientific textbook of forestry—how to tell the age of trees, how they grow, etc.
Forests and wildlife—browse, cover, etc.
Complete references and outlines are given in *Forestry*, Vocational Series No. 8, price 15 cents, Superintendent of Documents, Washington, D. C.

SOIL

Collecting and naming rocks and soils.
How are soils made? Kinds? How deep are they? How are they destroyed? Enriched? etc.
Soil map of Wisconsin—glacial history, driftless area, old lake basins, etc.
Sand table demonstration of erosion, gullies.
Field excursion to see examples of erosion and its control.
Soil erosion a national menace—methods of control, T. V. A., etc.
Wind transportation of soil, shelter belts.
Bulletin board committee—pictures, posters, etc.
Complete references and outlines for study of soil conservation in the government bulletin, *Soil Conservation*, Vocational Series No. 14, price 20 cents, Superintendent of Documents, Washington, D. C.

WATER USES AND WASTE

Story of your school and home water supply.
Methods of purifying water supply.
Pollution of streams and lakes.
How cities get their water supply.
Floods and their control—Mississippi, Wisconsin, Ohio, etc.
Water transportation, rivers, canals, etc.
Story of water power—mills, factories, turbines, etc.
Control of water power—government vs. private ownership.
Irrigation and power projects—T. V. A., Boulder Dam, Niagara, St. Lawrence, etc.
Water and soil conservation.
Streams and recreation—state parks.
Beaver dams—make one.
Story of man's uses of water down through the years.

Arbor and Bird Day

Practically all States encourage the annual observance of Arbor Day and Bird Day in some way, frequently through a gubernatorial proclamation directed to citizens in general, in which the special responsibility of the schools for their observance is emphasized. Many State departments of education issue publi-

cations annually or from time to time, giving definite suggestions for the observance of the day or days in the schools, including suitable materials or bibliographical references to such materials.

Pennsylvania

Pennsylvania offers an example of this particular type of contribution to conservation education. The following statements of purpose, with general suggestions for procedures, are quoted from the Pennsylvania State Bulletin, Arbor Day and Bird Day.¹²

State [Pennsylvania] courses of study in science consistently stress the importance of conservation of our trees and forest areas and need for extension beyond what the State now possesses. So, too, emphasis is placed upon how birds help mankind and the importance of protecting our native flowers. Arbor Day should be a time when the work in science relating to topics which the law intends Arbor Day shall represent is emphasized and extended.

The suggestions that follow are intended as helps for the teacher in making the experiences of Arbor Day and Bird Day contribute to the development of the knowledge and ideals that will make nature and nature's problems centers for enjoyment and careful thinking. A variety of experiences from which the teacher may choose are suggested. The best school program, however, is the one that most exactly fits local needs and problems. In short, the form that any Arbor Day and Bird Day program takes must necessarily be decided by the school officials and teachers.

Suggestions made are cast in terms of activities; they are things that the pupils may do. A considerable number of the activities listed imply a period of work preceding Arbor Day and Bird Day if the completed product is ready at this time. If the teacher wishes to organize a program to which the public may be invited, the activities chosen must be developed with this objective in mind.

Finally, Arbor Day and Bird Day programs should be joyous events. The primary purpose of the day is to build in the pupils friendly and appreciative feelings for trees, flowers, and birds; to stimulate them to protect and defend all that nature possesses that is useful and beautiful. Memorization of long poems, for which the pupils have no ardor, tests in which a sense of failure may linger, and other projects that may defeat the purpose of the day should be avoided. In short, every Arbor Day and Bird Day should be a Red Letter Day in the experiences of the pupils.

¹² Harrisburg, Pa., Department of Public Instruction, 1934. Bulletin No. 82.

GENERAL SUGGESTIONS

- A. Every class in connection with its Arbor Day and Bird Day program should emphasize the following units, either as independent or group activities:
1. Planting on at least one Arbor Day during the year, or nearest suitable day, of a young tree or nuts or other seeds of trees.
 2. Development of the school yard as a permanent bird refuge.
 3. Conservation and extension of the beautiful wild flowers of the State.
 4. Beautification of school buildings and grounds.
- B. Additional materials that generally lend themselves to Arbor Day and Bird Day observance include songs with a nature theme, especially songs included in the music texts that pupils have used and are using; phonograph records and compositions with a nature theme for other musical instruments; literature with a nature theme; slides and moving pictures. Slides appropriate for the day may be obtained from the Slide Division of the State Museum, Harrisburg. Moving pictures relating to nature subjects may be obtained from any one of the silent picture or sound picture firms.

SPECIFIC SUGGESTIONS

The suggestions that follow provide for both the autumn and spring Arbor Days and Bird Days and are to be used at the discretion of superintendents, supervisors, and teachers. Suggestions for the kindergarten and first nine grades may be used in two ways: As activities within the grade for which they have been especially organized; as backgrounds for a program by a particular group or the whole school working together. Suggestions for the senior high school are intended for group use. Where programs are developed by a group or the whole school, activities used each year should be noted in the bulletin so that future duplications may be avoided.

California

In California a forestry handbook concerned largely with conservation of forests, as the title indicates, but which involves also a study of or references to the larger aspects of conservation is recommended for use to all teachers and students in California by the State superintendent of public instruction. Among the topics treated in this bulletin which concern the general aspects

of conservation are: Conservation—Its Meaning; A National Program of Conservation; Conservation Agencies; Forest and Water Conservation; Wild Life in the Forests; Land and Men; California's Forest Playgrounds.

In presenting this handbook, Vierling Kersey, superintendent of public instruction for California, states:

It has been truly said that knowledge concerning the conservation of our natural resources should begin in the schools. Our generation is facing many problems connected with the wise use of land, and our students should be taught the lessons of conservation and forestry. In no other way will they, as future citizens, have a clear understanding of the relationship of our soil, water, and forests to the economic and social welfare of California.

Our conservation and forestry problem is twofold: First, to protect and use wisely the wealth of resources with which nature has so bountifully endowed California; second, to restore, insofar as possible, the soil, forage, water, forests, and wildlife of the State which have been wasted by man's carelessness and misuse. As Gov. Frank F. Merriam has well said, "Our beautiful forests and other native flora, our wildlife, streams, lakes, and seashore constitute the greatest pride in our Commonwealth. Their preservation bears definitely upon the future welfare of the State."

To meet the need for a better understanding of the principles of conservation and forestry, the following text has been provided for use in the classroom.

I commend this handbook to all teachers and students in California.¹⁸

OBSERVANCE OF CONSERVATION WEEK

In a number of States a week designated as "Conservation Week" is observed for the purpose of calling the attention of citizens to the need for the preservation of natural resources. Generally the Governor issues a special proclamation calling on the people and the schools to observe the week. State departments of education issue or distribute bulletins and pamphlets offering suggestions for its observance in the schools. Among such special pamphlets recently received in the Office of Education are those from California, Delaware, Maryland, Massachusetts, New Hampshire, Tennessee, Virginia and Washington.

¹⁸ Forestry Handbook for California. Issued by California Region, Forest Service, United States Department of Agriculture, in cooperation with California State Chamber of Commerce. Revised edition, 1936.

Usually such bulletins are prepared by or with the cooperation of voluntary organizations interested in conservation. State representatives of the Garden Club of America, of the General Federation of Women's Clubs, the American Nature Study Association, have contributed or cooperated with departments of education in many States. Local organizations such as nature study clubs, conservation committees, State planning commissions, wild flower preservation societies, and the like, have cooperated with State departments of education in the preparation of bulletins in all of the States noted. Massachusetts and New Jersey suggest specific projects for each day of the week. Other pamphlets present suggestive topics for study. Examples follow:

California

"Source Material for Conservation Week, March 3-9, 1935."
State of California Department of Education Bulletin No. 2,
January 15, 1935.

Contents

The Conservation Week Idea.
Home and School Beautification.
Conservation of Fish and Game.
Conservation of Trees and Forests.
Conservation, Bird, and Arbor Day.
Roadside Beautification.
Conservation of Wild Flowers and Shrubs.
The Native Vegetation of California.

Delaware

"Conservation Week." Compiled by Violet Liberty Findlay,
supervisor of nature study, Wilmington public schools, Wil-
mington, Del.

Topics

Wild Flower Conservation.
Conservation of Soil.
Conservation of Bird Life.
Conservation of Fish and Streams.
Tree Conservation.

New Jersey

"Conservation Week in the Schools of New Jersey, April 20-24, 1936." Distributed by Department of Public Instruction, State of New Jersey.

Daily topics

Monday—A General Survey.
Tuesday—Water for Man's Use.
Wednesday—Water and Wild Life.
Thursday—Water and Soil.
Friday—Water and the Forest.

Virginia

"Conservation Week in the Schools of Virginia, March 30 to April 3, 1936." Distributed by the Department of Public Instruction, State of Virginia.

The bulletin includes radio talks on wild flowers, soil conservation and trees, and gives references for further study and information to each; and an article on each of the following: Birds, fish, streams, and forests. It includes also the Ten Commandments of Trees and a list of subjects suitable for compositions, posters, and nature exhibits.

USE OF EXPERIENCE AND ACTIVITY UNITS IN CONSERVATION

There is a marked trend in recently prepared courses of study to emphasize teaching more through activity units and less through formal subject-matter presentation. Practically all of the newer courses include many suggestive examples of the unit procedure in instruction, emphasize the values to be gained from the use of this method, suggest lists of suitable topics and offer definite help to teachers for organizing subject matter around them as basic points of departure.

Conservation problems furnish many topics suitable for activity units on all school levels and one finds that the majority of courses of study include among the units suggested a number concerned with conservation problems or designed to foster appreciation of the need for conservation of both material and human resources. The State department of education of New York issues a special leaflet called "The Rural Hot Lunch as a Health and Social

Activity." The leaflet includes valuable information, recipes, and the like, as well as practical and easily followed suggestions for procedures in conducting the activity indicated in the title.

In addition to the extension of conservation education through inclusion of related units in courses of study, many individuals, supervisors, and particularly teachers formulate such units for use in their schools and classrooms. These units are sometimes based on the larger conservation problems national in scope or interest and sometimes on local problems and conditions. Because of the current interest in conservation education and in the use of experience units in conservation instruction, a few such units prepared for and used in the schools designated are presented here. They will suggest to teachers and school officials interested other topics and methods of presenting them adapted to conservation education in the localities in which they are to be used. They are probably representative of practices followed by individual teachers in many States.

For Elementary Grades

A. A STUDY OF FORESTS: AN INTEGRATED UNIT OF WORK FOR SIXTH AND SEVENTH GRADES.¹⁴

Some of the aims of education.—The teacher needs to be assured that the type of behavior exhibited in all situations is consistent with democratic ideals. The following statement of aims of education is to aid teachers to guide the children in this desired direction:

Emotionalized Attitudes of: Inquiry; Mental Integrity; Creative-self-expression; Self-integrity; Critical Mindedness; Open Mindedness; Responsibility; Concentration.

Appreciation of: The Beautiful; Shared Activity; Good Workmanship; Nature.

Understanding of: Interdependence of All Forms of Life; Man's Increasing Control of Nature; How Modern Science Has Transformed Ways of Thinking and Living; Necessity of Man's Adaptation to Changing Conditions; Orderliness and Balance of the Universe; Recreation as a Creative Agency; Relation of Health to Human Development.

¹⁴ An Integrated Unit of Work for Sixth and Seventh Grades. A study of forests prepared for use in the Virginia elementary schools, by Mrs. Alex Miller, teacher, and A. G. Cummings, superintendent, Kasey School, Bedford County, Va. Distributed by the Forest Service, U. S. Department of Agriculture.

Ability to: Read; Listen; Write; Function as a Wise Consumer; Maintain Health; Conform to Social Standards; Recognize and Use the Natural Phenomena, Plants, and Animals of the Environment; Speak; Study; Use Common Objective Materials and Instruments of the Social Heritage; Respond to Situations Requiring Neuro-muscular Skill. (Taken from the Tentative Course of Study for Virginia Elementary Schools.)

Kasey School is situated in a forested section of the Blue Ridge Mountains; hence, the setting for this unit of study is ideal. It furnishes a real situation in the child's experience, a direct contact from which he gains impressions that are used as a basis for study and further development. The interest of the children is immediate, the approach is both stimulating and challenging.

However, no child need be deprived of the study of trees, for cities and towns with their trees, parks, and forest reservations furnish abundant material.

UNDER THE ROUGH KIND

In the green veins of these fair growths of earth
There dwells a nature that receives delight
From all the gentle processes of life
And shrinks from loss of being.

—WILLIAM CULLEN BRYANT

Center of Interest: Study of Trees and Their Contributions to Our Living and Life.

Aspects Selected for Emphasis: Observing and studying trees in autumn; Observing and studying trees in winter; Observing and studying trees in spring; Observing and studying trees in summer.

The summer observations are to be made by the "Kasey School Forestry Club", its report to be made to the school next fall.¹⁵

B. A STUDY OF CONSERVATION.¹⁶

The teachers of the John Ericsson School undertook a study of conservation during the spring term of 1935 and offer the following suggested activities as a result of their work. The outline also includes their suggestions for activities to be undertaken in the fall of the year. Wherever possible the exact words used by the children during the development of the material have been used. This is especially true of the questions.

¹⁵ In the development of the unit, visits were made to the forests and to loggers' camps; books were read; reports developed; correlations made with history and other subjects; and the material generally integrated with other phases of the school program.

¹⁶ A report of a study of conservation made at the John Ericsson School, grades 1-6. Minneapolis, Minn., Minneapolis public schools, 1935.

FOR KINDERGARTEN AND GRADES I, II, AND III

- I. Spring term—Learning experiences.
 A. Learning about birds.
 B. Learning about seeds.
 C. Learning to conserve lawns.
 D. Learning about the work of rain water.

Questions of the children	Suggested activities	Conclusions to be drawn as a result of observations, experiments, and discussions
Where does all the rain water go?	Make excursions after a rain to see what has become of the rain water? Report of observations after rains. Show proof of statements. Study pictures which illustrate the work of rain water.	<ol style="list-style-type: none"> 1. Some water soaks into the ground. 2. Some water runs down hill over the ground. 3. Running water carries dirt, sticks, papers, seeds, and leaves with it. Sometimes it runs fast enough to carry pebbles or small stones. 4. Some water runs into the sewer. 5. Some water evaporates. 6. Grass keeps water from running down hill. 7. Water evaporates fastest from flat, bare ground and from the pavements and sidewalks. 8. Grass keeps water from evaporating fast.

- E. Learning how milk is cared for so it will not spoil.
 F. Learning about parks.

Questions of the children	Suggested activities	Conclusions to be drawn as a result of observations, experiments, and discussions
Do the lakes have to be taken care of?	Visit and talk about any neighborhood lakes. Report and account for: (a) Any changes in water level. (b) Any changes in clearness of water. (c) Any growth of weeds or water scums. (d) Animal life in water or on shores. (e) Warning signs found there or given in the papers or over the radio.	Lakes need care because: (a) The water gets low in dry seasons. (b) Careless people throw unsightly things into the water. (c) Sand, mud, sticks, and stones are washed into the lakes after heavy rains. (d) Weeds grow in shallow water and must be cut or pulled out. (e) Fish and other animals sometimes die because they cannot get air enough in hot weather. Warnings must be given to save life and health of girls and boys: (a) Against meddling with life lines and life boats. (b) Against unsafe ice. (c) Against germs which injure swimmers and bathers.
How are neglected lakes reclaimed?	Visit Lake Hiawatha and talk about the reclamation. Tell: (a) What was done. (b) Who did it. (c) Who paid for it. (d) Who keeps it up.	Lake Hiawatha was a swamp: (a) It was dredged to remove the plants and soil and to allow the water to enter. (b) The city did the work through its Park Board. (c) The city paid for it with taxes.

- G. Learning about the Indians.
- H. Learning about the pioneers.

FOR GRADES IV, V, AND VI

During the development of this study teachers of these grades were impressed with these facts:

1. Learning experiences relative to appreciation of the economic and aesthetic value of materials and conditions in nature, and understandings of the needs and methods of conservation of these values naturally accompany the units of the social studies.
2. Knowledges basic to these appreciations and understandings are science and can be best developed by scientific methods.

The learning experiences included in this outline were integrated with social studies, language, and reading; and in some cases were carried on in club work or reported by individual pupils.

FOR GRADE IV

A. Conservation of water in desert countries.

Questions of the children	Suggested activities	Conclusions to be drawn as a result of observations, experiments, and discussions
Why are the people of Arabia so careful of water?	Read stories and study pictures which tell about the scarcity of water in Arabia: (a) Desert sands. (b) Scarcity of plant life. (c) Oases and springs. (d) Irrigation.	<ol style="list-style-type: none"> 1. There is little natural food in desert countries. 2. Water is so scarce that people cannot use it for cleaning as we do. They clean their hands with sand. 3. Fertile spots (oases) are watered by springs. 4. Irrigation ditches lead water to gardens. 5. Water is controlled and equally divided for gardens.

B. Little need of conservation in the jungle.

C. Conservation in Holland.

FOR GRADES V AND VI

- A. What is the meaning and importance of conservation?
- B. Conservation of trees.
- C. Conservation of soil.

Questions of the children	Suggested activities	Conclusions to be drawn as a result of observations, experiments, and discussions
<p>What does running water do to the soil?</p>	<p>Take field trips to see—</p> <ul style="list-style-type: none"> (a) The work of water from melting snow, ice, and from rains. (b) To find gullies. (c) To find deposits of soil in low places. (d) To learn what kind of soil water carries from the farms. <p>Report and show pictures.</p> <p>Observe the work of gullies on roadways and on farm lands.</p> <p>Report and show pictures.</p> <p>Name rich farm lands in Minnesota, United States and other countries that are made fertile by running water.</p>	<p>Running water gathers, carries, and deposits soils in lower places. It carries away the finest and richest soils.</p> <p>Gullies cut back into rolling land and carry away good soil.</p> <p>Illustrations of fertile valley or lowland soils are—</p> <ul style="list-style-type: none"> (a) Minnesota River Valley. (b) Delta of Mississippi Valley. (c) Valley of the Nile.

D. Conservation of time.

TEACHERS' OUTLINE IN STUDY OF HOLLAND

Problem: How has Holland reclaimed and conserved its soil?

A. Steps in development:

1. Built dikes.
2. Dug ditches.
3. Drained land into ditches.
4. Connected ditches to canals.
5. Windmills pump water from canals outside dikes.
6. The big dike across entrance to Zuider Zee.
7. The Zuider Zee project.
8. Planted trees and grass on dikes to hold soil in place.
9. Careful planting and cultivating uses every inch of soil, thus keeping the wind from carrying away soil.

Learning Experiences for Children

1. Diagrams (individual) to show arrangement of ditches, canals, and dikes.

2. Diagrams at board.
3. On playground, noticed action of running water after rain.
4. Noticed presence of soil in running water.
5. Children reported visits to creeks, streams, and rivers.
6. One child brought a small tree to show how soil is bound by roots.
7. Another brought grass and quackgrass to show the value of grassbound dikes.
8. Collected pictures of canals, windmills, dikes, polder land, etc.
9. Collected information, stories, and poems about farming and canals in Holland.

For Secondary Grades

A. PLANS AND PLANNING.

The following outline for a unit on "Plans and Planning" for use in the twelfth grade is taken from a pamphlet issued by the Oakland, Calif., schools.¹⁷ The pamphlet presents a series of "suggested experiences to aid learning", each to be carried out under the teacher's direction. Suggestions for discussion, surveys and investigations, readings, etc., are included in the pamphlet, and students are directed in the preparation of dramatic skits, speeches, panel discussions, illustrations such as maps, charts, cartoons, and the like.

ADJUSTING SOCIAL STUDIES TO CONTEMPORARY LIFE AND PROBLEMS

Outline of Unit XVI, "Plans and Planning"

- I. Introduction to problem.
 1. Ever-present need for planning.
 2. Its recent rise in importance.
- II. Advantage of long-term local planning.
 1. In interest of utility and art.
 2. In the light of economy.
 3. Examples of successful planning.
 4. Consideration of local plans.

¹⁷ Hilton, Eugene. Students' Guide Book: Problems of Today. Unit 16, Plans and Planning. Oakland, Calif., Public Schools, October 1935. Mimeo.

III. National planning.

1. Possibility of planning for new social and economic order.
2. Examples of U. S. S. R., Italy, et al.
3. Possible success of planning in the United States.
 - (a) Federal efforts in agriculture, industry, etc.
 - (b) Present status and future outlook.
4. Appraisal of planning efforts of Roosevelt administration from various sources and points of view.

IV. International planning.

1. In relation to commerce and trade.
2. Attempts to control competition in armament.
3. League of Nations as an example of cooperative effort.
 - (a) Its successes.
 - (b) Its failures.
4. Work of the World Court.
5. Other international cooperative enterprises.

B. HOW IS MAN TRYING TO CONSERVE HIS NATURAL RESOURCES?

The following more detailed outline of a suggested unit of activity in the field of conservation for use at the high-school level was prepared by J. Ivor Carew Inness, under the direction of Dr. Herbert Bruner, Curriculum Construction Laboratory, Teachers College, Columbia University.

UNIT

Grade level, high school; time, 6 weeks

I. Problem: How is man trying to conserve his natural resources?

Major problems:

- A. Why is the conservation of natural resources important?
- B. What progress has conservation made to date?
- C. What constitutes an adequate conservation program, and how may it be applied, now and in the future?

II. Controlling theme: Man's adaptation to meet the requirements of subsistence.

Aspect of theme to be developed: Conservation.

III. Overview:

When the first settlers came to America they found a land of unbelievably rich soil, storing beneath its surface a vast wealth of minerals, watered by a glorious network of streams and mighty

rivers, and covered by virgin forests teeming with wildlife. They viewed the natural bounty of the country with wonder and then greedily set to work to conquer the wilderness and place the mark of civilization upon the land.

The history of the development of America is a story of gross stupidity and stark heroism, but one lasting blot upon the record of the early settlers and pioneers is their short-sighted squandering of land and forests and their ruthless extermination of wildlife.

A few leaders of vision having sounded the call, Americans began to be aware of what was happening to their patrimony, and to realize their duty to so use the natural resources of the land that posterity would not be robbed of the great American legacy, held in trust by successive generations.

When considering the matter of conservation, it is imperative that one recognize the fact that with most natural resources, material once wasted can never be replaced. Moreover, in the case of those which are renewable, the process of restocking is, at best, very slow; so much so that in many instances it cannot keep up with increasing demands.

For those reasons it is of the utmost importance to conserve now and to construct a foolproof flexible conservation program for future use.

This unit should lay particular emphasis upon the necessity of each person in the community, State, and Nation doing his share to advance the conservation ideal, and to support those conservation measures already in effect. Upon completion of the work the pupils should realize that conservation is not a short-term matter, limited to specific types or instances, but that it is a broad, far-reaching endeavor to guard the future against want.

IV. Suggested approaches:

1. Through an interest in government.

Address inquiries to the Department of Agriculture, Department of the Interior, etc. Specifically Bureaus of Forestry, Fisheries, Mines, State fish and game commissions, etc.

2. Through an interest in pictures:

Display pictures showing the results of forest fires, wasteful lumbering operations, soil erosion, also abandoned mining camps and workings, flood control projects.

3. Through an interest in wildlife.

Tell stories about our wild creatures and their lives and how they are valuable to man.

4. Through an interest in the work of organizations interested in conservation.

Boy Scouts, Girl Scouts, Woodcraft League, Campfire Club, etc.

5. Through an interest in agriculture.

Is it necessary to conserve land in order for agriculture to continue as a basic American industry?

6. Through an interest in the lives of conservation leaders.

Theodore Roosevelt, Gifford Pinchot, Major Powell, etc.

7. Through an interest in the effect of natural resources upon man's comfort.

Discussion.

8. Through an interest in our national parks.

Booklets published by Department of the Interior; railroad company booklets.

V. Content: Major problem A. Why is the conservation of our natural resources important?

Questions for major problem A.

1. What does an inventory show to be our present stock of natural resources?
2. How long may this stock be expected to last?
3. Which of our resources do we especially need to conserve?
4. What have been the main sources of waste?
5. How can resources now depleted or gone be replaced?
6. Why have we, as a people, been so wasteful of our resources?
7. On whom does the responsibility for this waste chiefly lie?
8. What legacy of resources will this generation bequeath to the next?
9. In what way is the conservation of soil closely related to the conservation of forest and water?
10. How is conservation of soil, water, forest interrelated?
11. What has created so much interest in conservation projects recently?
12. How will the existence of an operating conservation plan increase indigenous property values?

Outline of content for problem A.

1. What are our natural resources?

(a) Soil:

1. Provides a base of fertile material for agriculture.
2. Conserves and retains water (i. e., rainwater).
3. Soil erosion destroys fertility.
4. Soil erosion leads to floods (4—p. 385, par. 1).

5. Soil once carried away can never be replaced (4-p. 385, par. 2) (4-p. 389).
 6. Economic loss is tremendous (\$400,000,000 annually) (4-p. 385, par. 1).
 7. Soil erosion is not a local problem (4-p. 389).
- (b) Minerals:
1. Three kinds of minerals:
 - Fuels.
 - Metallics.
 - Nonmetallics. (2-p. 21, li. 24).
 2. Value of minerals has grown tremendously since 1890 (2-p. 20-see chart).
 3. Minerals, when once gone, are impossible to replace (2-p. 18, li. 29) (2-p. 23, li. 3).
(NOTE: Coal supply, 1927, 3,417,320 tons.)
 4. Conservation of minerals of vital importance (2-p. 21, li. 21).
- (c) Forests:
1. Main service to provide timber (2-p. 251).
 2. Important in the prevention of soil erosion and floods (2-p. 274) (2-p. 275) (2-p. 278).
 3. They act to protect arable lands.
 4. They provide shelter for wild life.
 5. They act as natural reservoirs (2-p. 278).
 6. They furnish a valuable use for land unsuited to agriculture (2-p. 281).
- (d) Waters:
1. For beverage purposes (5-p. 551-3).
 2. Water is the basis of life (2-p. 115).
 3. Possible classification as mineral (2-p. 116).
 4. Water supply when used renews itself (2-p. 116).
 5. Water conservation problem is one of more efficient use and of substitution for other materials (i. e. for power in lieu of coal) (2-p. 116).
 6. As a means of fostering agriculture, irrigation, etc.
 7. As a habitat for fish.
 8. As the basis of navigation.
- (e) Wild Life:
1. Two classes, game and nongame.
 2. Three divisions: Birds, animals, fish.
 3. We should recognize the right of all creatures to inhabit the earth.
 4. Value of wildlife is not alone economic, but also recreational and aesthetic (2-p. 413).

5. Supply should be kept available for future study and enjoyment.
 6. Some forms of wildlife beneficial to agriculture (2-p. 416-17).
2. What is the meaning and purpose of conservation?
 - (a) Conservation has come to mean, "the greater good for the greatest number for the longest time."
 - (b) It is the purpose of conservation, "to make this country the best possible place to live in, both for us and our descendants" (1-p. 39).
 - (c) It aspires to the most efficient use of those resources which cannot be renewed and to the perpetuation of those which are renewable (1-p. 39).
 - (d) It acknowledges the right of the present generation to fully satisfy its needs from resources now available, but it also recognizes, "our obligation so to use what we need that our descendants shall not be deprived of what they need" (1-p. 40).
 - (e) Conservation is most democratic in principle (1-p. 40).
 3. What is the main problem of conservation?
 - (a) To overcome, wherever possible, the loss, by waste, of the past and to prevent the squandering of resources in the future.
 - (b) This is a problem of "efficient development and wise utilization" (2-p. vii, li 18).
 - (c) To avoid the dangers and handicaps experienced by those countries with depleted natural resources: Fuel, food, etc. (2-p. 3, par. 4 to p. 4, par. 2).
 4. Why is the need for conservation imperative?
 - (a) The waste of natural resources, to date, has been appalling (2-p. 5) (2-p. viii) (2-p. 9) (2-p. X to p. XI).
 - (b) Because of the factor of slow or impossible replacement. ex. soil, (4-p. 385) (4-p. 389); minerals, (2-p. 18) (2-p. 23); etc. (2-p. xli 35).
 - (c) Because of man's greed and carelessness (2-p. IX, li 9) (2-p. XI) (2-p. 401) (2-p. 236).
 - (d) The comfort and happiness of man is dependent on conservation.
 1. This generation:
To retain basic materials.
For esthetic enjoyment.
 2. Posterity:
That they may have a share in the legacy held in trust by us. Because the hope of substitutes is very slim; nonexistent in some cases—minerals, soils, etc.

5. What can be done to conserve our present resources?
 - (a) Adequate conservation legislation efficiently enforced.
 - (b) Education of the public by Federal, State, and private agencies.
 - (c) Substitution, where feasible, of replaceable materials (i. e. waterpower for coal), by legislative direction.

Activities for developing problem A.

1. Prepare a chart showing in order of abundance and importance, the original stock of natural resources.
2. Enumerate sources of waste due to greed and those due to ignorance and carelessness.
3. List the byproducts, heretofore loss, that are now recovered as a result of conservation methods.
4. Write a theme on the effect of a curtailment of any of the natural resources used in or by your household.
5. Make a hike through the surrounding country and observe the natural resources.
6. Make a list of some animals, birds, etc., now extinct or nearly extinct because of inadequate game laws.
7. Name 5 major organizations that have to do with the preservation of birds, animals, etc., for example, the Audubon Society, etc.
8. State several ways in which citizens can aid conservation, in their daily lives, by not starting forest fires, shooting wantonly, or taking care of trees, flowers, soil in their lawns, etc.
9. Name 10 men holding important and national office who have taken an active interest in conservation.

VI. Content: Major Problem B: What progress has conservation made to date?

Questions for major problem B.

1. What do you already know about conservation?
2. What do you know about governmental conservation agencies, Federal and State?
3. Do you know of any conservation projects in your neighborhood?
4. Do you belong to any organization which features conservation in its program?
5. What conservation principles do you observe in your home, by shutting off water, conserving fuel, etc.?
6. Do you know of any ways of substituting materials? Through what agency did you learn of them?
7. How do the local game laws operate?
8. What do you know about the Forest Service?

9. In what ways has the application of conservation principles increased the supply of any of the natural resources?
10. What is the comparative efficiency of the various fuels, in terms of energy, and can this be increased?

Outline of content for major problem B: Progress made to date.

1. When did the idea of conservation first take root?
 - (a) Soil, 1888 (2-p. 5).
 - (b) Minerals, 1841, 1851, 1853 (2-p. 110), 1873 (coal)- (2-p. 41).
 - (c) Forests, 1891 (2-p. 5) (2-p. 240-1873).
 - (d) Waters, 1907 (2-p. 6).
 - (e) Wildlife, 1791 (2-p. 401), 1813 (2-p. 394).
2. Who were the first great leaders of the conservation movement?
 - (a) Gifford Pinchot (2-p. 6).
 - (b) Major J. W. Powell (2-p. 5) (3-p. 519-29).
 - (c) Theodore Roosevelt (2-p. 10, par. 1) (2-p. 11, par. 3).
 - (d) Chas. R. Van Hise.
 - (e) Daniel Carter Beard.
 - (f) Ernest T. Seton.
 - (g) Cecil T. Gray.
3. What are some of the organizations which have labored to establish a conservation program?
 - (a) Fowling and Fishing Association of Cape May City. 1813. (2-p. 394).
 - (b) New York Zoological Society, 1895.
 - (c) Natural Association of Audubon Societies, 1902.
 - (d) Isaac Walton League 1922.
 - (e) Wild Flower Preservation Society (Washington, D. C.).
 - (f) Boy Scouts of America.
 - (g) Girl Scouts of America.
 - (h) Woodcraft League.
 - (i) Campfire Club of America.
4. What are some of the governmental steps taken and agencies established for purposes of conservation?
 - (a) Forestry Bureau, 1891 (2-p. 5).
 - (b) Irrigation Division, U. S. Geological Survey, 1888 (2-p. 5).
 - (c) White House Conference of Governors. 1908 (2-p. 8).
 - (d) National Conservation Commission, 1908 (2-p. 9).
 - (e) North American Conservation Conference, Washington, D. C., 1909 (2-p. 10).
 - (f) Inland Waterway Commission, 1907 (2-p. 6).

5. What has been accomplished so far?

(a) Soil:

1. Soil Erosion Service, Department of Agriculture (engaged in combating erosion in 27 States, on approximately 27 million acres), 1933 (4-p. 399).
2. The checking of erosion is a combination engineering, forestry, cropping, soils, and extension project. (4-p. 400) also see (4-p. 401).

(b) Minerals:

1. Abandonment of the beehive coking oven.
2. Operation of federally controlled mineral deposits under the lease system.
3. Improved mining methods; leading to the conservation of lower grade areas.
4. More efficient use of mineral byproducts.
5. More universal reworking of salvageable minerals.

(c) Forests:

1. National forest reservations and parks.
2. State forest preserves and parks.
3. Establishment of the Bureau of Forestry, 1891 (2-p. 244).
4. Replanting of areas devastated by cutting and fire (2-p. 245).
5. Weeks Law (2-p. 310).

(d) Waters:

1. Rental instead of sale of Federal and State water power sites.
2. Soil erosion and reforestation projects conspire to conserve water resources (4-p. 385-404).
3. Inauguration of antistream pollution movement.
4. Interest has been aroused in the matter of saving underground waters (2-p. 123-4-5).

(e) Wildlife:

1. A new concept of wildlife conservation has evolved.
2. Conservation should not be of game alone but of wildlife in general (6-p. 169, par. 2).
3. Game creatures comprise only 10 percent of wildlife (6-p. 165, par. 1).
4. Classification as vermin is a selfish attempt to cultivate game varieties at the expense of all other forms of wildlife.
5. Species classed as vermin constitute some of the most valuable forms of wildlife. Ex. fur-bearers (6-p. 166-8).

6. Establishment of Federal and State conservation commissions.
 7. Ratification of Migratory-Bird Treaty Act 1916 (2-p. 455).
 8. Seal conservation treaties (2-p. 454).
 9. Increased work of Bureau of Biological Survey (2-p. 397).
 10. Outlawing of spring shooting (2-p. 423).
 11. Forest conservation park preserves, etc., conspire to aid wildlife conservation by providing sanctuaries and refuges.
 12. Program of public education in terms of conservation.
6. The growing interest in conservation is manifested in some of the government projects:
- (a) Boulder Dam.
 - (b) TVA.
 - (c) CCC.
 - (d) Middle West reforestation line.
 - (e) United States Bureau of Fisheries, etc.

Activities for developing Problem B:

1. Read the autobiography of Theodore Roosevelt.
2. On the basis of the work done in no. 1, write a theme on the work of Roosevelt in behalf of conservation.
3. Trace the work of Gifford Pinchot, and tell the class about his achievement.
4. Invite the leaders of some of the local conservation organizations to talk to the class about their aims and work.
5. Plan a program of class activity for Arbor Day.
6. Write to the State conservation commission for information about its work. Discuss this material in class.
7. Trace the effect of game laws in your locality.
8. Make a report on the reclamation of Utah by the Mormons.
9. As the result of reading, report to the class on any one of the larger conservation projects: TVA, CCC, etc.
10. Show how practical conservation would aid in the solution of flood control in the Mississippi River region.
11. Read the report of the White House Conference of Governors and present a summary to the class.
12. Trace the effects of the Weeks law on forest conservation and flood control.
13. Discuss the economic results of soil erosion.
14. Prepare a chart showing existing stocks of mineral resources.
15. Study and discuss the work of the Sanitary Water Board of Pennsylvania.
16. Write a theme on the evils of stream pollution.

VII. Content: Major Problem C: What constitutes an adequate conservation program and how may it be applied, now and in the future?

Questions for major problem C.

1. How is cooperation essential to efficient conservation management?
2. May conservation measures be safely left to individual effort?
3. How may an efficient, nonpolitical administration be obtained?
4. Is the Federal Government better able to cope with conservation problems, and if so, why?
5. Why is conservation a matter of personal importance to all the people?
6. How may a conservation education program be disseminated to the public?
7. On the basis of past accomplishment, what phases of conservation most imperatively require attention?
8. What part, in conservation education, can youth take?
9. How can more plentiful materials be obtained?
10. Why must the ideal conservation plan have a long perspective?

What constitutes an adequate conservation program and how may it be applied, now and in the future?

1. It must have balance.
 - (a) Agencies functioning in the cause must be coordinated.
 - (b) It must display a regard for the needs of all groups.
 - (c) It must place the permanent needs of all mankind, present and future, above immediate profit.
2. It must be self-perpetuating.
 - (a) The public must be educated by:
 1. A continuously operative fact-finding organization.
 2. Efficient dissemination of facts found through the radio, press, schools, etc.
 - (b) There must be provision for growth.
3. The administration must be kept free of political patronage and intrigue.
 - (a) Vacillating policies.
 - (b) Incompetent officials.
 - (c) Pressure of interests, lobbies.
 - (d) Betrayal of public trust—Teapot Dome.
4. It should provide for participation of the individual.
 - (a) All citizens, by helping to elect conservation-minded officials.

- (b) Farmers, by correct plowing, tree replacement, soil protection and nourishment, crop rotation, etc.
 - (c) Urban dwellers, picknickers, and campers to exercise consideration with regard to roadside flowers and shrubs and observe caution as to campfires, rubbish, etc., observe game laws.
5. The far-sighted conservation program should provide for the taking of a natural resource inventory at regular intervals.
 6. The future application of conservation ideals depends largely upon the education of the rising generation.
 - (a) Boy and Girl Scouts.
 - (b) Through the agency of the schools.
 - (c) Through the agency of sportsmen's clubs.
 7. Conservation is an interlocking subject; not limited to specific resources.

Activities for developing problem C:

1. Study and discuss the current conservation program.
2. Prepare an outline of a conservation policy for your school.
3. Write to the Department of the Interior for a list of free publications. Do likewise with other Federal departments engaged in conservation work.
4. Outline the possible permanent application of the principle of the CCC to conservation work.
5. Outline some of the ways in which the individual can aid in conservation.
6. Write a theme about the injurious results of political patronage, intrigue, and lobbying.
7. Outline the importance of education in fostering conservation.
8. Discuss the ways by which conservation methods may be practically applied in the future.
9. Write a theme on the value of periodic natural resource inventories; take either affirmative or negative.
10. Draw a map of the Mississippi River basin and explain to the class how erosion control and reforestation would help to reduce floods.

VIII. Culminating Activities:

1. Stage a class debate on this topic: Resolved that the conservation of natural resources is a duty incumbent upon each generation.
2. Prepare a pageant, showing on the one hand the pioneer's prodigal use of natural resources, and, on the other, the struggle of future generations laboring under a shortage of these resources.

3. Arrange an exhibit showing the interlocking nature of conservation.
4. Debate on this topic: *Resolved*, That the Federal Government, through legislation and control, is the best agency to manage a conservation plan.
5. Make a chart showing the ways in which materials may be substituted for those which are partially depleted.

IX. Evaluation:

1. Have the pupils grown in these understandings?
 - (a) The resources of a country determine its activities and become the basis for settlement of many of its social, political, and economic problems.
 - (b) As society becomes more complex, there is a tendency toward greater governmental control and supervision.
 - (c) A wealth of resources tends toward waste and exploitation.
 - (d) As man's scientific knowledge increases, his consideration of resources becomes keener and more critical.
 - (e) Natural resources represent a vast legacy for posterity held in trust by the present generation.
2. Have the pupils acquired these essential informations?
 - (a) Development of Boulder Dam project.
 - (b) The story of F. D. Roosevelt's proposed Middle West Reforestation Line.
 - (c) The conservational value of the Civilian Conservation Corps.
 - (d) Development of the Tennessee River Valley project.
 - (e) Facts concerning the International Seal Patrol.
 - (f) The work of the United States Bureau of Fisheries.
3. Have the pupils shown growth in the following habits of work?
 - (a) Finding and using reference material more effectively.
 - (b) Carrying on independent research work.
 - (c) Working without loss of time and keeping their attention upon the work at hand until the desired end is attained.
 - (d) Cooperating more effectively in group work.
 - (e) Finding answers to specific questions.
 - (f) Extracting meaning from the printed page.
 - (g) Drawing valid conclusions from materials read.
 - (h) Organizing and expressing ideas through writing, drawing, and through other means of communication.
 - (i) Taking notes on reading materials.
 - (j) Finding and following new problems to a solution.

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- (b) HOBBS, WM. HERBERT. John Wesley Powell. *Scientific Monthly*, 39: 519-529, December 1934. #3.
- (c) McATEE, W. L. Conservation of Game or Wild Life—Which? *Scientific Monthly*, 38: 165-69, February 1934. #6.
- (d) MORGAN, ARTHUR E. The Tennessee Valley Authority. *Scientific Monthly*, 38: 64-72, January 1934. #7.
- (e) PINCHOT, GIFFORD. A B C of Conservation (in, Fanning, C. E. Selected articles on the conservation of natural resources. N. Y. 1919. 153 p.). See p. 39 (on) #1.
- (f) VAN HISE, HAVEMEYER, LOOMIS, *et al.* Conservation of Our Natural Resources. New York, Macmillan, 1930. 541 p. #2.
- (g) WOLMAN, ABEL. Can You Live Without Water? *Scientific Monthly*, 39: 551-553, December 1934. #5.

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- (f) VAN HISE, HAVEMEYER, LOOMIS, *et al.* Conservation of Our Natural Resources. New York, Macmillan, 1930. 541 p. #2.
- (g) WOLMAN, ABEL. Can You Live Without Water? *Scientific Monthly*, 39: 551-553, December 1934. #5.

¹⁸ The numbers are the key to references in the preceding outlines. e. g. (4-p. 385, par. 1) refers to reference (a) p. 385, paragraph 1.

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Based on Van Hise (1910) various areas of subjects—forests, land, water, minerals, and wild life covered by those competent.

WILBUR, RAY L., and DU PUY, WM. ATHERTON. Conservation in the Department of the Interior. Washington, U. S. Government Printing Office. 253 p.

Well written and mechanically pleasing. More than 150 illustrations.

WOLMAN, ABLE. Can you Live Without Water? Scientific Monthly, 39: 551-3, December 1934.

In this article Mr. Wolman reviews briefly the importance of water and mentions some of its uses. He also makes a strong plea for the conservation of our water resources.

ZIMMERMAN, ERICH WALTER. World Resources and Industries. New York, Harpers, 1933. 842 p. illus. maps.

A Functional appraisal of agricultural and industrial resources.

BIBLIOGRAPHY FOR PUPIL

FAIRBANKS, H. WM. Conservation Reader. World Book company, 1920.

Presents the idea of saving and replenishing our natural resources for economic purposes. Written with an understanding of the interests of children. Has science material for any of the grades.

FISHER, ELIZABETH F. Resources and Industries of the United States. New York, Ginn and company, 1928.

The book aims to give young people a vivid and accurate picture of industries in the United States and to emphasize the need for conservation.

JOHNSON, JULIA EMILY, *comp.* Federal and State Control of Water Power. Philadelphia, H. W. Wilson, 1928.

Endeavors to set forth impartially selections of representative current discussion on the water power question. Material is as general discussion, presenting affirmative and negative sides on the question of government control and operation. Briefs and a selected bibliography are included.

PRICE, O. W. Land We Live In. New York, Dodd, 1911.

Protection of forests, wild animals and fish, water power, and minerals.

YOUNG, ROBERT S. Our Federal Lands; a Romance of American Development. New York, Scribner's, 1928.

This book contains a general survey of our Federal possessions, public domain, parks, forests, monuments, etc. Also chapters on reclaiming the desert, water power, resources, conservation of wild life, etc.

CONSERVATION IN TEACHER-EDUCATION INSTITUTIONS

TEACHER-EDUCATION activities related to conservation programs and conservation education are many. For the most part these activities are associated with forestry courses, nature study, and science. A partial list of the institutions offering courses in conservation or providing courses or activities which appear to be definitely related to conservation follows. Brief information concerned with the offerings is included for each institution:

ALABAMA POLYTECHNIC INSTITUTE, AUBURN: Provided during summer of 1936, a 3,000-mile tour as a course in Eastern America.

SANTA BARBARA (CALIF.) STATE TEACHERS COLLEGE: Conducts a school of nature study in cooperation with a citizens' committee, composed of representatives of interested organizations, one purpose of which is to foster conservation of beneficial flora and fauna, together with personal well-being. To dispel false impressions, superstition, and misinformation, and to spread the truth.

COLORADO STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS, FORT COLLINS: Offers mountain trips during summer session to Estes Park, Rocky Mountain National Park, and elsewhere. Offers practical field instruction during summer session in a college forest of 1,600 acres in and near Pingree Park. Has a forestry camp.

COLORADO STATE COLLEGE OF EDUCATION, GREELEY: Gives course in "Science of the Out of Doors", and the usual courses in general science, etc. Frequent outdoor excursions conducted.

UNIVERSITY OF COLORADO, BOULDER: Maintains summer camp in Rockies for instruction in geology, botany, and zoology, also for recreation. Conducts numerous field excursions.

UNIVERSITY OF MICHIGAN, ANN ARBOR: Has "Bogardus Tract" of 3,000-4,000 acres where summer work in biology is offered. In Colorado, 8-week field courses in geology are offered during summer. Frequent excursions made from Ann Arbor, in

geology courses. Field courses in geography are offered in Northern Michigan, during summer especially, and in New England and Japan.

UNIVERSITY OF MISSOURI, COLUMBIA: Has a summer camp in geology at Lander, Wyo.

UNIVERSITY OF NEW HAMPSHIRE, DURHAM: Conducts Marine Zoological Laboratory; offers course in methods of teaching biology; and conducts study of zoology, on Appledore Island. Six weeks during summer.

NEW JERSEY STATE TEACHERS COLLEGE, TRENTON: Offers course in "Conservation of National Resources", a study of the natural resources of the United States in their relation to the development of the Nation, and the need for their conservation and development. Includes a study of such resources as minerals, forests, soils, waterways.

CORNELL UNIVERSITY, ITHACA, N. Y.: Places special emphasis on courses for teachers of agriculture and industrial arts during summer. Outdoor work included. Offers a wide variety of courses in botany and related subjects during regular year, with outdoor excursions. Recently maintained a summer field school in geology.

NEW YORK UNIVERSITY, NEW YORK CITY, DIVISION OF GENERAL EDUCATION: Offers a field course in natural history sponsored by the American Museum of Natural History and the Garden Clubs of Long Island.

NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING, RALEIGH: Offers summer camp instruction in forestry.

PENNSYLVANIA STATE COLLEGE, STATE COLLEGE: Has two professors of nature education. Offers several courses and a curriculum in subject. Has frequent outdoor excursions. Prepares teachers and supervisors of nature study or general science for elementary and secondary education, supervisors of camp work, protectors of bird sanctuaries and game preserves, and persons interested in the conservation of natural resources.

STATE TEACHERS COLLEGE, SLIPPERY ROCK, PA.: Has a wildlife preserve used extensively for nature study, etc., as an outdoor laboratory. Frequent excursions, campfire circles, and the like are conducted in connection with courses offered and with the recreational life of the institution.

GEORGE PEABODY COLLEGE FOR TEACHERS, NASHVILLE, TENN.: Offers course on "Conservation of Natural Resources." Emphasizes the value of conservation teaching in the public schools and the problem of source material and the adaptation of source material to use in elementary school instruction.

BRIGHAM YOUNG UNIVERSITY, PROVO, UTAH: Has a summer camp in Wasatch Mountains near Provo in which science and a certain amount of nature study are offered, among other subjects.

UTAH STATE AGRICULTURAL COLLEGE, LOGAN: Conducts excursions to study the geology, botany, and zoology of the Yellowstone, the Colorado Grand Canyon, and the Utah National Parks.

VIRGINIA POLYTECHNIC INSTITUTE, BLACKSBURG: Offers summer field course in geology and other subjects.

WEST VIRGINIA UNIVERSITY, MORGANTOWN: Offers two field courses during summer, one in botany and one in zoology; and conducts a 6-week biological expedition, conducts tours of State covering many interesting biological regions.

UNIVERSITY OF WYOMING, LARAMIE: Offers full-time courses in outdoor aspects of botany, geology, zoology, and general science for general science teachers during summer. Some of this work is done in the Medicine Bow National Forest, where a permanent summer camp is located.

CONSERVATION IN ORGANIZATIONS AND AGENCIES

A PARTIAL list of agencies and organizations, governmental and private, which engage in educational conservation activities is presented in this section, with a brief description of such activities carried on by a few of them for which information is available. Further information may be secured directly from the organizations named.

GOVERNMENTAL AGENCIES

Department of Agriculture

BUREAU OF BIOLOGICAL SURVEY: Conserves wildlife; acquires and maintains bird refuges and game preserves; administers wildlife conservation laws; cooperates in development of improved methods of propagation of fur and other animals.

EXTENSION SERVICE: Sponsors 4-H Clubs whose work includes a conservation education program.

FOREST SERVICE: Has general administration of national forests; conducts forest research; promotes improved forestry practices; regulates grazing in national forests; manages watersheds protected by national forests; supervises forestry emergency activities of the Civilian Conservation Corps; cooperates in development of State forests.

SOIL CONSERVATION SERVICE: Promotes use of soil conservation practices in agriculture; conducts research and demonstration projects in soil conservation; directs erosion-control activities of Civilian Conservation Corps.

Other services of the Department of Agriculture whose work to a limited degree involves conservation include: Bureau of Agricultural Engineering, Bureau of Animal Industry, Bureau of Chemistry and Soils, Bureau of Entomology and Plant Quarantine, Bureau of Plant Industry.

Department of Commerce

BUREAU OF FISHERIES: Develops methods of regulating the fish industry and supply in the interest of conservation; administers Alaska fisheries and fur-seal industries, and care of the Pribilof

Island natives; administers laws for the protection of Florida coast sponges; and enforces the law regulating the interstate shipment of large- and small-mouth black bass.

Department of the Interior

BUREAU OF MINES: Charged with the investigation of methods of mining; preparation and utilization of mineral substances, with special reference to the safety of mine workers and the improvement of their working conditions, and the prevention of waste through increased efficiency. It also collects and publishes statistics covering mineral production of the United States, and makes studies of economic problems affecting the mineral industries.

BUREAU OF RECLAMATION: Directs investigation of irrigation resources; manages irrigation projects; has supervision over construction of Boulder Dam and the development of the Colorado River Basin; also over the Grand Coulee Dam and Columbia River Basin.

DIVISION OF TERRITORIES AND ISLAND POSSESSIONS: Supervises and assists in rehabilitation programs under way in Puerto Rico and the Virgin Islands.

DIVISION OF GRAZING: Administers public domain grazing districts.

GENERAL LAND OFFICE: Supervises the survey, management, and disposition of the public lands and minerals therein.

GEOLOGICAL SURVEY: Classifies public lands and examines geologic structure, mineral resources, and mineral products of the national domain; conducts investigations on quantity, distribution, mineral quality, availability, and utilization of water supplies in the United States, and studies production of hydroelectric power for public use; examines and classifies public lands as to their mineral resources and their value for power development; supervises oil, gas, and mining operations on public lands included in prospecting permits and leases under mineral leasing laws.

NATIONAL PARK SERVICE: Directs protective work toward preserving national parks, etc., for all generations and utilizing them to the best advantage for the benefit and enjoyment of the visitor; furnishes public educational service in natural sciences, history, and archaeology, in connection with areas under its care; participates in the Emergency Conservation Work program and supervises work camps engaged in recreational development on State, county, and municipal areas; cooperates with regional and State planning boards and conservation agencies.

OFFICE OF EDUCATION: Maintains cooperative relations with all school systems in the United States and conducts research, advisory, and informational services on all matters concerned with education, including conservation education. Cooperates with War Department in establishing and conducting an educational program in Civilian Conservation Corps camps; appoints educational advisors of whom there are 2,090, i. e., one advisor to each camp.

OFFICE OF INDIAN AFFAIRS: Its work involves management of all matters relating to the welfare of the Indian, including his economic development, education, community life, health, development of Indian lands, etc.; also responsibility for the Alaskan native.

PETROLEUM CONSERVATION DIVISION: Assists the Secretary of the Interior to administer the Connally Law, which prohibits shipment in interstate commerce and foreign commerce of petroleum or its products produced in excess of the amount permitted by law.

Department of Labor

THE DEPARTMENT OF LABOR has jurisdiction over matters pertaining to the welfare of American wage earners. Its Women's Bureau has special charge of promoting the welfare of wage-earning women and the Children's Bureau investigates and reports on all matters pertaining to child life and child welfare among all classes of Americans, especially those questions relating to infant mortality, birth rate, orphanages, juvenile courts, desertion, dangerous occupations, accidents, diseases of children, employment, and legislation affecting children in the several States and Territories. It also has responsibility for the administration of that section of the Social Security Act relating to maternal and child health services, services for crippled children, and other child welfare services.

Department of the Treasury

BUREAU OF PUBLIC HEALTH SERVICE: The governmental guardian of public health works to prevent the spread of human contagious and infectious diseases. Conducts scientific research and disseminates information on health matters, disease, and problems of sanitation; cooperates with other Government departments in matters pertaining to public health and sanitation, with various local health agencies in spreading health educational services, and assists State health departments in improving local health conditions.

War Department

OFFICE OF CHIEF OF ENGINEERS: Responsible for the improvement, ordered by Congress, of rivers, harbors, and other navigable waters; cooperates with the Federal Power Commission in investigating and supervising power projects affecting navigable waters.

BOARD OF ENGINEERS FOR RIVERS AND HARBORS: Considers and investigates plans for improvement of river and harbor facilities, and the engineering, commercial, navigation, and economic questions involved in the proposed projects; conducts investigations toward promoting water transportation; and compiles and disseminates data and information concerning ports and water transportation.

NATIONAL FOREST RESERVATION COMMISSION: Purchases such forested, cut-over, or denuded lands within the watersheds of navigable streams as in its judgment may be necessary to the regulation of stream flow and the production of timber.

Independent Governmental Agencies

AGRICULTURAL ADJUSTMENT ADMINISTRATION: Includes among its activities the carrying out of provisions of the Soil Conservation and Domestic Allotment Act, some of the objectives of which are: (1) Preservation and improvement of soil fertility; (2) promotion of the economic use and conservation of land; (3) diminution of exploitation and wasteful and unscientific use of national soil resources; (4) protection of rivers and harbors against the results of soil erosion, for the purpose of aiding flood control and maintaining navigability.

EMERGENCY CONSERVATION WORK: One of the purposes for which this agency was established is "to provide for the restoration of the country's natural resources and the advancement of an orderly program of extensive public works." The work of the Civilian Conservation Corps is included in the activities of this agency, as well as other work projects involving conservation of natural resources on Federal areas, including national parks, Indian reservations, the Territory of Hawaii, Virgin Islands, grazing districts, reclamation projects, national forests, etc. Conducts research incident to Emergency Conservation Work operations in forestry and control of tree diseases and tree-destroying insects, etc.

FEDERAL POWER COMMISSION: Organized to administer the Federal Water Power Act which provides for the improvement of navigation through the development of water power on streams subject to Federal jurisdiction or on public lands by private and governmental agencies acting under licenses issued

by the Commission, licenses so issued to be subject to conditions prescribed to promote navigation, and to conserve water-power resources for the public good. It is authorized to conduct general investigations of power resources.

NATIONAL BITUMINOUS COAL COMMISSION: Its purpose, to administer the Bituminous Coal Conservation Act of 1935, in order to conserve the bituminous coal resources of the United States; to stabilize the bituminous coal-mining industry and to promote interstate commerce; to promulgate a bituminous coal code and to study and report upon the problems confronting the bituminous coal industry.

NATIONAL RESOURCES COMMITTEE: In cooperation with Federal, State, regional, municipal, and private agencies and institutions, prepares plans and reports on the development, use, and conservation of land, water, mineral, and other natural and human resources; takes inventory of land resources and uses, and investigates problems and control measures; studies the mineral resources of the country and considers problems of competing fuels; inventories water resources and investigates water problems, analyzing and making economic, geographic, social, and engineering evaluations of water projects; studies industrial and population problems.

RESETTLEMENT ADMINISTRATION: Its activities include initiating and administering rural rehabilitation projects and projects concerned with soil erosion, stream pollution, seacoast erosion, reforestation, forestation, flood control, and other useful projects of this type.

TENNESSEE VALLEY AUTHORITY: Responsible for the maintenance and operation of Government-owned properties in the vicinity of Muscle Shoals, Ala., which involves planning for the complete Tennessee River watershed, including erosion control, forestation, the further use of mineral resources, the promotion and coordination of industry and agriculture, surveys and plans for the proper use of land and other natural resources, and the general social and economic well-being of the valley.

Illustrative Programs in Governmental Organizations

Two of the governmental organizations referred to place particular emphasis on educational activities related to conservation of natural resources—the 4-H Clubs, directed by the Extension Service of the Department of Agriculture, and the Civilian Conservation Corps, the educational work of which is directed by the Office of Education of the Department of the Interior. Their activities are described somewhat more fully, therefore.

THE 4-H CLUB PROGRAM OF CONSERVATION

The 4-H Club has developed a program with reference to wild-life conservation. This is described in detail in Suggested Conservation Program for 1936. (Prepared by the Extension Division of the Department of Agriculture.)

The objectives of the 4-H Club conservation program are as follows:

1. To develop a conservation conscientiousness by interesting rural youth in a definite conservation activity.
2. To make it an educational program by disseminating correct information relative to its economical value as applied to agriculture.
3. To assist in maintaining a balanced ratio of one species of wildlife to that of other species of wild life.
4. To assist in establishing a nature study course in every urban and rural school.
5. To make rural home environment more attractive and develop a fuller appreciation of our natural resources.

An example of conservation activities as carried on in connection with 4-H clubs is the program developed by the Agricultural Extension Service of Missouri. The activities suggested for 4-H club boys and girls are as follows:²²

1. *General Wild-Life Activities.*—Carry out three or more of the following suggested wild-life activities:
 - (1) Make a survey and draw a map of your farm or community to determine what wild life, food, cover, and predators are present.
 - (2) Keep a monthly record of the wild-life population of your farm or community, including especially song birds, cottontail rabbits, quail, wild turkeys, and fur-bearing animals.
 - (3) Make a study of fur-bearing animals on your farm or community, and count the pelts taken.
 - (4) Determine when, where, and why wild life increases or decreases at certain places or periods of the year, if any. Then, plan to correct the most unfavorable conditions of food, cover, and predators, such as stray cats and other predators, after making sure that such predators are reducing

²² Missouri. Cooperative extension work, Agriculture and home economics. Suggested conservation subjects and related activities for your 4-H club in 1936. Columbia, Mo., University of Missouri, Agricultural extension service, 1936.

the more desirable wild-life species and by preparing and managing a wild-life refuge.

- (5) Propagate quail for restocking and maintaining depleted areas, as shown by the survey.
- (6) Propagate pheasants.
- (7) Organize a rifle club; make a study of the game laws of Missouri; and cooperate with officials in observing the game laws.

2. *Bird Study.* Carry out *three* or more of the following suggested activities of bird study:

- (1) Learn to identify 15 varieties of birds, helpful in the control of insects, and study their life habits.
- (2) Make a bird calendar: Keep a record of spring arrivals, mating periods, laying, hatching, migrations, etc.
- (3) Build bird houses and bird baths, and make a bird house exhibit.
- (4) Prevent the destruction of eggs and the disturbing of female birds during the nesting season. Fence off nesting and breeding areas, if feasible, to prevent overgrazing and trappings by livestock. During the hay-cutting operations, mark nests with sticks to which strips of cloth are tied as a warning so that nests may be saved.
- (5) Protect and encourage the growth of natural bird food along fence rows and in corners not needed for crop production, or make special plantings for the birds to feed on. Do winter and spring feeding, if necessary; and provide water during summer drought periods.
- (6) Study five or more varieties of water fowl, and learn to know the animals which are harmful to them. Plant food and maintain natural refuges; and help control water levels.

3. *Forestry.* Carry out *three* or more of the following suggested forestry activities:

- (1) Learn to identify 10 or more trees native to Missouri. Collect twigs, leaves, needles from conifers or evergreens, and fruits or seeds of trees identified. Mount and label these tree specimens; and list the principal uses to mankind of each tree identified.
- (2) Learn the kinds of woods best suited for the manufacture of the following farm or home equipment: Plow handles, ax handles, singletrees and doubletrees, fence posts, floors, fuel wood, chairs, tables, lumber.
- (3) Plant 15 or more trees, 15 or more shrubs and/or wild flowers for home, school or roadside beautification; or set out a windbreak about the farmstead.

- (4) Take care of the ornamental or shade trees about the home and farm, by providing for weed control, watering if necessary, pruning, and protection against fire and rodents.
- (5) Collect nuts from historic or rare trees and propagate them for future plantings.
- (6) Learn how trees grow.
- (7) Learn to identify 10 or more wild flowers, 10 or more weeds, or 10 or more insects native to Missouri.
- (8) Study the value of trees in controlling soil erosion, in providing game cover and food for wild life and for beautification and recreational purposes.
- (9) Study fire prevention and the elimination of fire hazards and help to create sentiment in the community against unnecessary fires.
- (10) Arrange for and conduct trips to State parks, noted springs, scenic places, and national forests.

4. *Fish and Streams.* Carry out *two* or more of the following suggested activities about fish and streams:

- (1) Learn to identify the important game fish and rough fish, found in local waters; and learn and observe the fish regulations and fish laws of Missouri.
- (2) Compare streams which have fish with streams in which fish do not live, and find out the causes of these conditions.
- (3) Learn to improve streams by building practical dams that will provide deep pools in which natural food will grow; by planting trees for shade and food along banks of water areas; and by providing shelter by sinking an occasional log, brush-pile, or tree.
- (4) Rescue game fish from shallow water areas which are likely to freeze solid during the winter or to dry out during the summer and transplant such fish to suitable water areas; and do not waste the fish you catch, nor attempt to catch the limit every time you fish.

5. *Soil Conservation.* Carry out *two* or more of the following suggested soil conservation activities:

- (1) Learn to identify the common types of soil on your farm or in the locality, and collect and label samples of each type for an exhibit.
- (2) Build permanent cobblestone or concrete soil-saving dams, or temporary soil-saving dams of brush, etc.
- (3) Learn to test soil for lime needs.
- (4) Plant trees or shrubs or sow grass for erosion control along streams, in gullies, and on hillsides; and list the chief causes of soil erosion.
- (5) Learn how to use a rod and level in preparation for terracing.

CONSERVATION EDUCATION IN THE CCC

The camps of the Civilian Conservation Corps offer superior opportunities for training in nearly every phase of conservation. Its importance in the education program is illustrated by the fact that camps are known by the type of conservation work being done, such as: National Forest, National Park, State Park, Soil Conservation, National Monuments, Biological Service, or Reclamation Service Camp.

The training given in the field is of a very practical nature and consists of such work as planting, growing, and transplanting young trees (more than 500 million were planted in 1935); clearing forests of undesirable brush or trees which are too numerous (this is known as "forest liberation"); the spraying and clearing of forests and shade trees of pests such as the "gypsy moth"; draining of swamps and ditching of tide lands for reclamation and mosquito control; surveys of Government-owned forests, lakes, and streams, road and trail building (more than 55,000 miles of road were built one year); fire tower construction; fighting forest fires; construction of park buildings and trails; landscaping; building bridges and culverts; building large and small dams; building fences; laying out and grading terraces; planting cover crops; building game refuges; and dozens of other interesting jobs.

The conservation training in the camps is tied in as closely as possible with the field training, and is usually given by a member of the Forest, Park, or Soil Conservation Service. Talks followed by discussion are effective. These talks may vary from the care and use of tools to some tall tale of Paul Bunyan or other legendary character in forestry; usually they concern the work being done. Moving pictures are also used extensively in conservation instruction.

The field training stimulates interest in such related subjects as mathematics, engineering, science, biology, geology, as well as the purely academic subjects.

Latest reports indicate that 27,485 instructors, most of them voluntary, are on duty in the camps. Many are college-trained foresters and engineers. Of these, 9,832 are from the Forest, Park, Soil Conservation, or other technical services, and nearly all are giving instruction in conservation.

When we realize that soil equal in area to the States of Massachusetts and Connecticut has already been washed away in the United States, the importance of conservation instruction for all citizens is seen. The young men in the camps are not only learning the theory of conservation—they are applying up-to-date methods of conservation in their work every day. They are learning how to conserve the forests, parks, water, wildlife, and historical sites of the Nation. It is hoped that much of this instruction in conservation will be carried to their home community and result in a more judicious use of our natural resources.

NON-GOVERNMENTAL AGENCIES AND ORGANIZATIONS

AMERICAN FORESTRY ASSOCIATION, Washington, D. C.

Encourages conservation in the field of forestry. Magazine, "American Forestry."

AMERICAN HUMANE EDUCATION SOCIETY, 180 Longwood Avenue, Boston, Mass.

Publishes material on humane activities intended to further conservation programs.

AMERICAN NATURE ASSOCIATION, Washington, D. C.

Issues books, a publication entitled "Nature Magazine" and other material to stimulate public interest in every phase of nature and the out-of-doors, and is devoted to the practical conservation of the great natural resources of America.

AMERICAN WILDLIFE INSTITUTE, Washington, D. C.

An organization for the restoration of North American wildlife.

BOY SCOUTS OF AMERICA, National Office, 2 Park Avenue, New York, N. Y.

Among the "Merit Badge Series" of publications issued by this organization for the purpose of encouraging boy activities in special fields are many which relate to conservation, such as Agriculture, Animal industry, Bird study, Conservation, Forestry.

CAMP FIRE GIRLS, INC., 41 Union Square, New York, N. Y.

Promotes conservation through "Torch Bearer Craftsman in Conservation" program and through Nature Lore.

EDUCATIONAL CONSERVATION SOCIETY, 43-13 Laurel Hill Boulevard, Woodside, L. I., N. Y.

Prepares information and material on conservation teaching in the schools.

GARDEN CLUB OF AMERICA. Conservation and Roadside Committee. 598 Madison Avenue, New York, N. Y.

Prepares information on various aspects of conservation. Cooperates with agencies and organizations developing conservation programs. Distributes material.

GENERAL FEDERATION OF WOMEN'S CLUBS. Department of Education. 1734 N Street, Washington, D. C.

Has active program in the field of conservation activities.

GIRL SCOUTS, Inc., 570 Lexington Avenue, New York, N. Y.

Has a program of Outdoor Life and Conservation as a part of the Girl Scout Work.

IZAAB WALTON LEAGUE OF AMERICA, INC., Merchandise Mart, Chicago, Ill.

Prepares and distributes material on woods, waters, and wild life. Publishes "Outdoor America." Encourages organization of Junior Izaak Walton Leagues to enlist the interest and support of boys and girls in the cause of conservation.

NATIONAL ASSOCIATION OF AUDUBON SOCIETIES, 1775 Broadway, New York, N. Y.

Prepares information and material relating to birds. Publishes magazine, "Bird Lore."

NATIONAL RECREATION ASSOCIATION, 315 Fourth Avenue, New York, N. Y.

Collects and disseminates information on all types of recreational activities, assists in carrying on local community recreation projects, publishes monthly magazine, "Recreation." Includes consideration of conservation and nature projects in its recreational activities.

NATIONAL SAFETY COUNCIL. EDUCATION DIVISION. 1 Park Avenue, New York, N. Y.

Publishes "Safety Education." Collects and disseminates information on problems relating to safety education. Information available on preparation of courses of study and on the organization of extracurricular activities such as junior safety councils and school boy patrols.

WILD FLOWER PRESERVATION SOCIETY, 3740 Oliver Street, Washington, D. C.

Prepares information and materials on the preservation of wild flowers.

WILDERNESS SOCIETY, 1840 Mintwood Place, Washington, D. C.

Publishes "The Living Wilderness." Organized to furnish leadership and encourage activities directed toward the preservation of our remaining wildernesses on state and private lands which have no governmental protection.

Activities of the Camp Fire Girls

Among the private, nongovernmental agencies which carry on educational work in conservation for youth are the Camp Fire Girls, Inc., and the Izaak Walton League. Brief descriptions of their activities as illustrative of work carried on by organizations of this type follow.

TORCH BEARER CRAFTSMAN IN CONSERVATION

1. Find out from talking with old inhabitants, from old records, books, and pictures, as much as you can about what your State was like when the first settlers came into it. What animals were common then that are seldom or never seen now? How much of the State was forested then? Was stream flow and soil erosion different then? Show changes that have been brought about by man, which are advantageous and which are not. Include this information in a notebook or write a story describing the region around your home as an Indian would have seen it 400 years ago.

2. Choose one: (a) Plant four trees or six shrubs to beautify some spot (other than your own garden) to help with erosion control or to increase rare species. These may be seedlings transplanted from some spot in the woods that needs thinning or may be young plants from a State or private nursery.

(b) Maintain a bird bath for 3 months and a bird feeding station for 3 months and be responsible for two other people doing the same. Keep a record of birds that use the bath and feeding station regularly.

(c) Cooperate with a group of people in having some plot of ground set aside as a bird and game sanctuary. See that there are provisions for birds to secure water and food and that they are protected from hunters.

3. Procure seeds of wild flowers through Garden Club, State or private nurseries. Plant and grow them in some public place (school, church, park, highway), having secured permission. Keep a record of cost, if any; seeds sown, when, under what conditions; proportion that bloomed and when.

4. Visit some area where effects of soil erosion may be seen, if possible, a soil conservation demonstration. Interview local, State, or Federal conservation authority or county agricultural agent about soil erosion conditions in your county and State. Send to State or Federal soil conservation bureaus for information. Write a report of what you have learned, telling causes of erosion, how it affects you, your neighbors, the State and Nation; what is being done or can be done to control it. Illustrate your report with sketches, charts, diagrams, clippings. Have this report placed on exhibit and give a talk based on it at a Public meeting.

5. Gather information about the national parks, purpose, location, special features, maintenance, accommodations, regulations. Consult National Park Service publications, magazine articles, people who have visited the parks. Choose two and plan a trip to visit them, including map of itinerary from and to your home and approximate cost for two people. List what you ex-

pect to learn in nature lore and conservation at these parks, or, if possible, take the trip and report what you have learned.

6. Earn one honor in each of the divisions of nature lore, in addition to those earned in fulfilling the other requirements.

7. Earn three of the following nature honors, in addition to those earned in fulfilling the other requirements:

- 129 Enter a wild flower conservation exhibit in a flower show.
- 130 Name your State flower. Tell what plants are protected by law in your State and why. What others need protection.
- 131 Make a wild flower conservation poster, 12 by 15 inches or larger, and have it displayed.
- 132 Make four colored slides of wild flowers which should be conserved in your locality and have them shown.
- 133 Collect and identify five specimens of fungous diseases of plants important or widespread in your locality. Explain symptoms and ways to combat the diseases.
- 226 Tell the origin and significance of Arbor Day. Celebrate the day yourself or with others.
- 227 Give a 10-minute talk before a group on the subject of a forest, its uses, abuses, ways of protecting forests from fire, fungous diseases, and insect enemies. Include some of your own observations.
- 228 Tell the part trees play in conservation of wildlife, soil, and water supply. Illustrate with observations and facts about your part of the country.
- 229 Give a 10-minute talk before a group telling about conservation in the United States as it is related to reforestation, explaining the need for it and what is being done. Include some of your own observations.
- 230 Make a tree or forest conservation poster, 12 by 15 inches or larger, and have it used in a display.
- 529 Write a paper of 500 words on the value of birds to man. Include hawks and owls.
- 530 Find out which birds are protected by the Nation and by your State, how and why.
- 531 Make a bird conservation poster 12 by 15 inches or larger and have it used in a display.
- 532 Give a 10-minute talk on bird conservation to a group. Include natural causes of bird destruction, man-made causes, what can be done to control them, what you can do and have done.
- 533 From personal observation name and describe four birds which should be protected because of their economic value to man. Tell why.
- 611 Write a paper of at least 500 words on game conservation and have it approved by some authority on the subject.

- 926 Explore a brook for half a mile, make a sketch or map of its course and notes of your observations regarding varying speed of water, depth and width of channel, bottom, banks, rocks, vegetation, fish, insects. Note particularly signs of erosion and transportation of soil.
- 927 In case there has been a definite disturbance of the earth's surface in a place with which you are familiar (earthquake, dust storm, or flood) write a "newspaper report" of causes and effects of this disturbance. Accompany this report with pictures drawn, snapshots, or clippings from newspapers.
- 930 Make a picture chart or diagram showing what happens to the rain that falls on a certain piece of ground in your locality (hygrocycle).
- 931 Make a colored diagram showing water table, ground water, underground stream, spring, artesian well, and explain four ways in which ground water is valuable.
- 932 Demonstrate to a group the difference in absorption of water where earth is covered with vegetation and where it is bare.
- 933 Make a diagram showing comparative soil erosion when ground is covered with forest litter, sod, grass crops, wheat, corn, or is bare. Explain why.
- 935 Make a map of headwater streams and little waters in your county or a neighboring county. Trace their course and explain their relation to soil transportation.

8. Start a library of information regarding conservation. Include a notebook or file of notes and clippings, pamphlets from Government and other sources, a bibliography, and books if possible.

9. Send notebook or story required in number one or report required in number four to national headquarters for the permanent exhibit.

Activities of the Izaak Walton League of America

There has developed in the Izaak Walton League of America, a movement to enlist the interest and support of boys and girls in the cause of conservation. This has resulted from a recognition of the fact that the boys and girls of today must assume the leadership of this cause during the years to come.

This movement is in keeping with the desire of the Izaak Walton League to consider its work not only in the light of the present, but in the distant future. A firm foundation must be built to assure a competent management to conservation work of the future.

With the advent of the Boy Scout and the Girl Scout movements, the Campfire Girls, the 4-H clubs, and other junior groups, of

which there are a number, great advantages have come to large numbers of boys and girls. While a part of the training provided by these groups includes the acquiring of a knowledge of the outdoors, there is no well-defined effort being made to bring to the boy and girl a broad appreciation of outdoor values as they affect the economic and moral life of our people.

It has been estimated that it costs approximately \$4,000 to bring up the average boy. The cost to bring up the average girl is slightly higher. Every city, town, and community, therefore, has an investment of many millions of dollars in its boys and girls. The present generation has a grave responsibility to intelligently administer this investment by providing the proper and complete training for our citizens of tomorrow.

As civilization advances in America, greater attention and care must be given to our outdoor heritage. There are many jobs to be done by our men and women and by our boys and girls. The youth of our country should assist in the program of the Izaak Walton League, as it exists today and should learn to help itself in the doing of those things which are so largely for its own benefit. There is no more worthy cause to which the tremendous energy of our youth could be directed.

It may be the opinion of a chapter that local conditions do not warrant the separate organization of a junior chapter for the dissemination of conservation information. Existing junior groups may be induced to add conservation features to their activities giving the local chapter the responsibility of providing this training. Through the public schools a great many boys and girls may be reached who are not members of junior groups. This would be a very valuable supplement for chapters that do not have an organized junior chapter.

While it is urged that the senior chapter avail themselves of every opportunity to carry on a general educational program among boys and girls it is felt that chapters are building more soundly and adding to the stability of the senior groups by training and directing the youth through the duly organized Junior Walton chapter.²³

²³ Organization Procedure and Program of Activity for the Junior Member of the Izaak Walton League. Chicago, Ill., National Headquarters, Izaak Walton League of America, 222 North Bank Drive.

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The list of Government publications should be helpful for authoritative information chiefly. Some of these publications may be obtained without cost; others are available at a nominal cost.

The list of State and local publications is suggestive to school officers and teachers particularly. The materials listed were prepared to promote and assist education in conservation or closely related subjects, generally by or in cooperation with education officials, and may be considered as representing a cross section of material used in schools throughout the country.

GENERAL BACKGROUND AND INFORMATIONAL MATERIAL

AMERICAN MUSEUM OF NATURAL HISTORY. Trailside conservation, parts 1 and 2. New York, N. Y., American Museum of Natural History, Department of publications and education, 1933.

ARIZONA TEACHER. Vol. 24, no. 2, October 1936.

This number largely devoted to problems of conservation education for the schools of Arizona.

BILLINGS, NEAL. A determination of the generalizations basic to the social studies curriculum. Baltimore, Md., Warwick and York, 1929. 289 p.

CASWELL, HOLLIS L., and CAMPBELL, DOAK S. Curriculum development. New York, American Book Co., 1935.

CHASE, STUART. Rich land, poor land: A study of waste in the natural resources of America. New York, McGraw-Hill Book Co., 1936. 361 p.

CONSERVATION. Cornell rural school leaflet, vol. 29, no. 3, January 1936. Ithaca, N. Y., Cornell University, New York State College of Agriculture.

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EDUCATION FOR CONSERVATION. Education Commissioner Stuebaker proposes service to arouse understanding of wildlife preservation in schools. *Nature Magazine*, 27: 239, April 1936.

Editorial commenting on the Commissioner's proposal.

EDUCATIONAL CONSERVATION SOCIETY. Outlines of college and university courses in conservation. Woodside, L. I., N. Y., the Society.

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FOREST PRIMER. Sixtieth forestry anniversary, Second edition, 1936. Published by American Tree Association. 32 p.

FORESTRY HANDBOOK FOR CALIFORNIA. Revised. Issued by California region, Forest Service, United States Department of Agriculture, in cooperation with California State Chamber of Commerce, 1936. 47 p.

4-H CLUB GUIDE IN WILDLIFE CONSERVATION. Compiled and edited by the Extension Service, South Dakota State College and the South Dakota Department of Game and Fish. Pierre, S. Dak., South Dakota Department of Game and Fish, 1936. 40 p.

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SCHRIEVER, F. Conservation education law in Wisconsin, 1935. *School science and mathematics*, 35: 941-42, December 1935.

SEARS, PAUL B. *Deserts on the march*. Norman, Okla., University of Oklahoma press, 1935. 231 p.

THORNHILL, J. F. P. *Greater London: A social geography*. London, Christophers, 1935. 138 p.

A study of the geographical factors underlying the development of London and which must underlie the planning of its future. Suggestive to students who wish to make social and geographical studies of other communities.

VINAL, W. G. Bob-white quail: A unit of work in conservation. *School science and mathematics*, 35: 479-87, May 1935.

VAN HISE, C. R., HAVEMEYER, LOOMIS, and others. *Conservation of our natural resources*. Revised edition, edited by Loomis Havemeyer and others based on Van Hise's, *Conservation of natural resources in the United States*. New York, Macmillan Co., 1930. 551 p.

WATER AND ITS WORK. Units of instruction. *Utah Educational Review*, 30: 31-33, 89, September-November 1936.

GOVERNMENT PUBLICATIONS

LITTLE WATERS. A study of headwater streams and other little waters, their use and relations to the land. Prepared for Soil Conservation Service, Resettlement Administration, Rural Electrification Administration. Washington D. C., Superintendent of Documents, November 1935—Revised April 1936.

NATIONAL RESOURCES BOARD. Reports. Washington, D. C., U. S. Government Printing Office.

The National Resources Board issues from time to time reports on land and regional planning. Some of special interest are: *General Conditions and Tendencies Influencing the Nation's Land Requirements*; *Agricultural Land Requirements and Available Resources*; *Land Available for Agriculture Through Reclamation*; *The Problem of Soil Erosion*; *Forest Land Resources, Requirements, Problems, and Policy*; *Planning for Wildlife in the United States*; *Recreational Use of Land in the United States*.

NATIONAL YOUTH ADMINISTRATION. Tentative outline for a construction and conservation program. Washington, D. C., National Youth Administration, November 27, 1936. (NYA Circular no. 9.) mime.

Contains suggested types of construction and conservation project activities, believed to be helpful by indicating the desirable nature of certain values in such projects.

SOIL, THE NATION'S BASIC HERITAGE. Prepared by the land-grant colleges and universities of the Tennessee Valley States cooperating with the United States Department of Agriculture and the Tennessee Valley Authority. Washington, D. C., U. S. Government Printing Office. (n. d.)

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Arranged alphabetically by subjects, with a subject index.

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UNITED STATES. DEPARTMENT OF THE INTERIOR. Dedicated to conservation. Washington, D. C., U. S. Department of the Interior, 1936. 20 p.

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