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Abstracts of source materials on the conservation of our natural resources.

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ABSTRACTS OF SOURCE MATERIALS ON THE CONSERVATION OF OUR NATURAL RESOURCES

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Eunice Wheeler Duncan

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INTRODUCTION

Conservation is a vast subject with many ramifications, but it is a very concrete one. Though few of us realize it, conservation of our natural resources --both human and material--touches all of us. In the lack or abundance of our food, in the price we pay for our clothes, in the availability of our utilities, in the luxury or poverty of our homes, in our personal and community health--in all these and many more ways, we are affected. Our natural resources are important not only to the conservator and the exploiter, but to every man and woman in America, and to the children who will inherit the land.

Until the time of Theodore Roosevelt there were practically no conservation practices and very little material was published on the subject in America. As President, and with the assistance of Gifford Pinchot, Theodore Roosevelt called a meeting of all state and territorial governors for the purpose of working out some plan for conserving our country's natural resources. This White House Conference of Governors took place in 1908. Though much enthusiasm was aroused, tangible and far-reaching results were few.

By the early 1930's the Federal Government began

to study land-use and water problems in the United States. Conservation programs and projects followed rather rapidly. In 1933 the Tennessee Valley Authority was created, the Civilian Conservation Corps was established and the Soil Erosion Service (now called the Soil Conservation Service) was organized. The Tennessee Valley Authority was the first national experiment in regional resource development and conservation. The Civilian Conservation Corps engaged in extensive national park reforestation and other conservation work. The objective of the Soil Conservation Service is to propagate the use of soil-conservation practices in agriculture. In 1934 the National Resources Board (since 1939 called the National Resources Planning Board) was created and made the first national survey of land-use conditions in the United States. Other important governmental agencies, appropriations, acts, and projects have followed since that date.

Slowly the states began to plan conservation programs. Now forty-five states have conservation departments, and all states and outlying territorial possessions have some type plan and agencies to work on their particular conservation problems. Many interstate compacts have been formed to care for projects which overlap state boundaries.

Other agencies and organizations have furthered

the cause of conservation. Among these are the American Forestry Association, the Izaak Walton League of America, the Garden Club of America, the National Association of Audubon Societies, the Wild Flower Preservation Society, the American Wildlife Institute, the Wildlife Federation and many others. Many civic clubs and women's organizations throughout the country are also interested in conservation.

All these agencies--the Federal Government, State governments, clubs, organizations, and individuals have published an extensive amount of rich study material within the last decade. Much of the material has been in the form of bulletins, phamplets, reports, studies, and investigations. Because of the newness and complexities of the subject a writer usually confines his work to one field in conservation.

Most of the material is on an adult level. It is only recently that educators have begun to integrate conservation in the curriculum. There is still much controversy as to how conservation should be treated--whether as a separate subject or as an integrated part of the subjects already established in the curriculum. Some other problems in the educational field are those of teacher training, organization of material and the scarcity of reading material at elementary and junior high school level.

This study has been made with the objective of compiling all the reading material possible on conservation. This material has been summarized in such a manner as to include the important data on conservation and it's place, level, and possible use in curricular programs. Books, bulletins, phamplets, reports, magazine articles and other types of material have been abstracted. All phases of conservation have been considered--soil, forests, water, minerals, wildlife, and human resources.

To the best of my knowledge this is the most recent compilation of conservation material. To me it has already been of invaluable aid in organizing my own source materials in the curriculum. I trust that it may serve other teachers and interested persons in a like manner.

SOIL RESOURCES

A Bulletin on Conservation of Natural Resources, State Department of Education, Division of Public Instruction, Denver, Colorado. Undated. 136 p. illus.

This bulletin gives a clear picture of the history of land use in Colorado from the time of the cliff dwellers through the buffalo people, the explorers, the hunters and trappers who made no excessive demands upon the land, through the cattlemen and farmers who made a business based on the richness of the earth. The stock raisers injured and depleted the grass; then the farmers plowed it up. The resulting erosion by winds and rains has created many problems. Each successive wave of settlement in Colorado was either a result of a boom period somewhere else or in someway connected with a pattern of life in which buying and selling had become a dominant factor.

A survey of Colorado's land resources is presented. The rivers, land formations, climate, soils and native vegetation and wild life are discussed. The correlation between the erratic and limited rainfall, wide variation in growing seasons, irrigation problems and agriculture are shown. The behavior of soil and water and man's influence are clearly defined.

Solutions to Colorado's problems are being aided through agencies such as the State College of Agriculture, State Engineer's Office, Water Conservation Board, Soil Erosion Districts, United States Forest Service, United States Grazing Service, United States Soil Conservation

Service and others. A description of how a Soil Conservation District works is given.

Realizing that education is an important factor in approaching the solution to any problem, this bulletin has been published for the use of teachers. The material is excellent basic or source information necessary in an understanding of land problems and the effects of misuse of land resources.

A Tentative, Suggestive Special Unit on Washington History, Washington Department of Public Instruction, Olympia, September 1941. 26 p.

This unit, to be used in American history classes, on a junior high school level, integrates conservation of the soil and water under the topic "farm problems." Attempts to solve these conservation problems include farmers' cooperatives, and projects of the Federal Government. Another appropriate place to study conservation problems would be in relation to the lumber and fish industries in Washington.

Most of this unit is concerned with the political history and development of this state, yet conservation has been outlined in one section, and other opportunities are usable.

This unit gives a fairly good example of how conservation can be integrated with history.

Adrift on the Land, Taylor, Paul S. Public Affairs Committee, New York. 1940. 32 p. illus. Phamplet No. 42.

Every year from one to two million men, women and children move about the country seeking farm jobs. Most of these

follow the crops from one section to another, finally returning to their homes.

Wheat caused the greatest trek of farm labor from 1900 to about 1930. Cotton too caused migration, particularly, in the southwest. Mechanization in the form of combines, ginning machines and pickers has caused a decline in these migrations. Berry crops which require a large number of skilled hand pickers have long been a cause of seasonal migration. Usually the distance covered by these migrants is not great. Sugar beet workers move only twice a year. On the West Coast roving field hands follow the harvests of fruits and vegetables. California and Arizona agriculture have been torn by frequent strikes and disputes. These conflicts differ from ordinary farm labor disputes because of (1) industrialized agriculture, (2) desire of employers for complete control of wages as distinct from other costs, (3) perishability of crops, (4) lack of status of mobile workers in agriculture, (5) interstate migration. The problems relating to migratory labor in California should not be considered as local or isolated. In a sense, it may be that the situation in that state provides a "pre-view" of what will occur in varying degrees and in modified forms on a national scale.

The farm problem is becoming a problem of the relation of people to the land on which they work, and not a problem of price alone. This phamplet is a vivid description of our migratory agricultural labor and its problems; no attempt is made to solve these problems. It aids in the understanding of the situation. Progressive citizens should read it with keen interest.

Agriculture, (Non-vocational Course of Study for Grades Nine and Ten), Iowa Department of Public Instruction, Des Moines. 1940. 153 p.

Seven units on agriculture stress the problems relating to Iowa. Much use is made of community environment. The units deal with social and economic phases of agriculture as it influences farm and city dwellers. The economic factors include ownership, tenancy, credit, labor, prices, and agricultural surpluses. Modern practices for efficient production of livestock and crops are taken up. Some thought is given to bettering living conditions of farmers--conveniences, housing, equipment, etc. The unit on conservation of farm land is concerned with rotation of crops, use of fertilizers, contour plowing, crops that return certain elements to the land, and help received through working with county agents.

The units are worked out as problems accompanied by questions to be used in preparation for discussion. These questions are thought-provoking. The weakness of the units lies in the lack of creative and activity work--no suggestions for excursions, experiments, visual aids, etc. are given. Since these units are of most use in rural community schools, opportunity for such activity should be provided. References, most of which are free, are adequate and up-to-date.

For the use of teachers, the units are bases for understanding agriculture and its problems, but supplementary additions are needed.

Conservationist in Mexico, Leopold, Aldo; American Forests.

March 1937. pp. 118-120 illus.

Our southwestern mountains are now badly gutted by erosion, whereas the Sierra Madre range across the line still retains the virgin stability of its soils and all the natural beauty that goes with that enviable condition. It is ironical that Chihuahua, with a history and a terrain so strikingly similar to Southern New Mexico and Arizona should present so lovely a picture of ecological health, whereas our own states are so badly damaged. However, this contrast holds good only for the mountains. The low country on both sides of the boundary has been equally abused and spoiled. The Sierras escaped because of the mutual fear and hatred between the Mexicans and Apaches; they were never settled, never grazed, hence never eroded. The Chihuahua Sierras have been grazed only near the Mormon colonies, but these colonies are microscopic when compared with the bulk of the mountain region.

Very recently the Mexican Resettlement Administration has scattered landless voters over many a non-irrigable mountain valley. Inevitable ruin will follow, but as yet these resettlements are very small when compared to the mountain area. The Sierras present an example of abundant game population; a normal complement of predators is present. Many loose-masonry dams are found in the Sierras--built by prehistoric Indians. These little dams were built to create little fields or food patches.

The tourist-promotion policy of the Mexican government of road-building plus settling of the mountain valleys will increase grazing; the end result will be bad unless Mexico

does a better job of grazing regulation than the United States has done.

This article aims to explain why the Sierra Madre range is an example of unspoiled mountain landscape, and to philosophize on the irony of it. Interestingly written, it is for adult reading.

Conservation of Lands and Water, A Teaching Unit, Santa Cruz School, Albuquerque, New Mexico, Curriculum Labratory, University of New Mexico. May 1938. 31 p. mimeo.

This unit uses the environment of the group as subject matter. Living in the Santa Cruz Valley, their families farmers, the children's interests are closely related to land use. They had witnessed floods; they had seen cattle die from lack of feed; they had seen parts of their father's fields washed away; they were naturally interested in why water, which is so destructive, was necessary, where it came from and how it could be controlled. Their activities (maps, excursions, experiments, sand table building, weather charts, stories and songs) were rich and varied. The knowledges and attitudes gained were ones that they could use in their daily lives. The unit must have been a very meaningful experience to these children.

No teacher could or would care to carry out exactly this same unit, but it gives definite help in how to carry out such a unit in any community. This unit, used in a second grade, gives good ideas for studying your own community. The activities can be adapted to the individual situation. The bibliography would be helpful to any study of conservation of land and water.

Deserts on the March, Sears, Paul B. University of Oklahoma Press, Norman. 1935. 231 p.

Nature has a certain botanical or biological balance, which the abuse and ignorant use by man sometimes disrupts. Men destroy soil through unwise use, and the soil becomes a desert. The effects of destroying the forests, over grazing, plowing up great areas of grasslands, overcropping and cultivation and the resulting deserts of sand and dust, floods, swamplands, erosion, droughts, and pests (insects, rodents, disease) are discussed in detail. The social-economic implications for people in all regions--eroded, flooded, and dust scarred--are discussed. The way out of such a wasteful and unproductive state is a great task; there is no one soverign remedy, but a combination of methods must be employed--methods which may be skillfully adjusted to the particular situation. Longtime planning, and in some instances, government control is necessary.

The situation is presented in nontechnical language, always simple, and often dramatic and witty. This book deserves a host of readers and is highly recommended for scientist and layman, educator and statesman, farmer and city dweller, for it is a timely and solemn warning against greed and expediency, lest the history of our continent become a chronicle of deserts on the march.

Farmers Without Land, Vance, Rupert B. Public Affairs Committee, New York City. 1937. No. 12. 31 p.

There has always existed in America a strong belief in the values of farm ownership. Yet since 1880 there has been an increasing rate of tenancy in the United States. The de-

pression has not lessened the problem of insecurity on the land. Left to itself, tenancy seems bound to increase until it affects more than half our farms. The most able attempt to rationalize the system is found in the agricultural ladder theory developed by W. J. Spillman.

Stable ownership and security of tenure are definitely related to good practices in growing of crops, in the control of erosion, and in the care of buildings and property. As it is hopeless to throw the responsibility for conserving the land on farm tenants, it is also too much to hope that they will support a healthy community life. On church and on school, farm tenancy lays a heavy hand.

In the great Cotton Belt, farm tenancy is but one phase of a complex situation. The link between tenancy and cotton production is close. Race enters the picture as another important element. In a recent study made by the W.P.A. it was found that the typical plantation was occupied by the landlord and fourteen additional families: three wage hands, eight croppers, two share tenants, one renter. The task of the landlord requires skill and energy. Yet many plantation landowners were not full-time farmers--31% spent more than 1/4 of their time at other occupations. Low income, poor housing, poor diets, inadequate medical and health services, few educational opportunities--these are the tenant's lot. The President's Tenancy Committee in 1936 showed the need for a National program to work out this complete situation.

This phamplet deals with all phases of the tenancy problem, and some of those affected on the landowner. Written on a senior high level, it discusses one of the big

problems related to our agricultural program.

Fields in Winter, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol 33, No. 3. January 1940. 32 p. illus.

Snow banks are important to wildlife--as warm homes for some animals, and as loss of food for other animals. The run-off of snow and ice in relation to plant growth is discussed. Plants are important as shelter and food for game. Fence rows and rockpiles in winter help form snow drifts, thus providing shelter for many animals. Weed patches and road cuts serve a purpose--that of sheltering wildlife. Animals cannot find protection in heated homes, but the snow makes warm shelter for them. On cold days it is warmer under the snow than on top of it. Grouse, squirrels, and other animals seek protection under the snow. Tracks one may observe in the snow are described.

The discussion stresses the problems of open fields in winter, and wildlife. Wildlife is considered as having definite money value and much economic use is discussed. The activities are rather limited, but with such material, that is to be expected. The cartoons present ideas necessary for understanding the management of open spaces in winter for wildlife. They are clever and upper elementary and junior high students will appreciate them. Much of the material can be read by fifth and sixth grades.

Gardening for Food and Fun, (Conservation Week in New Jersey Schools, 1941), New Jersey State Conservation Committee, Trenton. 15 p. illus.

Gardening is an interesting experience. It is most likely to be an educative experience when it is carried out under the guidance of a teacher who can utilize the garden as a necessary labratory for teaching science. It provides firsthand contact with natural things. It teaches the dependence of man and other animal life on plant life. The school garden site need not be large, but every garden should be planned in detail. Soil must be considered, as well as tools, care, and vacation plan of care. Exhibits, canning and preserving are excellent activities. Animal friends (birds, toads, snakes, earthworms, etc.) as well as enemies are considered.

This leaflet is excellent, for teacher use, where facilities are such that schools can have gardens, either vegetable or flower. The activities are many and varied; children get great satisfaction from them; many phases of nature study enter the picture. The bibliography is excellent.

Holes in the Ground, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol 35, No. 2. November 1941. 31 p. illus.

Soil is in different layers. The turf layer is a loose layer at the top where the soil and plant parts are mixed. The next is the topsoil--valuable for growing plants. Beneath the topsoil is the subsoil, which slowly becomes topsoil. In a forest the looseleaf-covering of the soil is called duff or forest litter. Duff is full of holes unless the leaves are firmly packed. Many animals burrow through it. Mice, moles, woodchucks, grasshoppers, ants

and worms make holes in the soil. These holes let in air and water and help to form topsoil. A valuable digger must dig many holes; it must bring soil from beneath to the surface; it must not destroy the plants we wish to grow; the earthworm meets all these requirements.

Plants make holes in the ground when they sprout. Shallow rooted plants as well as deep rooted ones hold the ground particles from washing. Legumes such as alfalfa, peas, beans, clover, etc. take nitrogen from the air and use it to make plant food that is excellent. Small holes, which can be seen with a hand lens, are very important. These are made by nematodes and protozoa. Air and water are very important in the soil. Erosion is less severe if plants, earthworms, and other animals have provided enough holes, for less water is lost. Farmers may check erosion by contour plowing, rotation of crops, planting cover crops and not overgrazing or burning over the land.

This leaflet explains the make-up of soil, and factors influencing making topsoil; how farmers can make wise use of their land. Parts could be used by classes above the fourth grade. The illustrations and diagrams are excellent.

Land Use and Soil Conservation, (Informational Material Available to the Public), United States Department of Agriculture, Soil Conservation Service, Washington. 1940. 7 p.

Listed are: (1) Publications on (a)The Soil Conservation Service, (b) General Farm Practices, (c) Primary Regional Interest (Northeastern, Southeastern, Ohio Valley, Western Gulf, Upper Mississippi Valley, etc.). Given are title, date, pages, price and where to order. (2) Maps of erosion

and land surveys, Available to farmers, agricultural workers, tax assessors, highway engineers and others. (3) Film Strips--title, price and where to order (can be rented, borrowed or purchased). (4) Magazine--Soil Conservation - 10¢ a copy or $1.00 a year. (5) Movies--16 mm. sound--available on loan. (6) Photographs and slides. (7) Charts--illustrating erosion problems and conservation practices. (8) Miscellaneous (outlines, units for elementary and secondary schools).

Every person interested in conservation should have this phamplet for it gives sources of materials available through the Soil Conservation Service.

Navajo Land, Tappan, Julia B. Soil Conservation Service, Division of Education, Albuquerque, New Mexico. 1939. 11 p. mimeo.

This dialogue between an old man lamenting the waste of land, and a young man telling him how it can be restored, would be of interest to fourth, fifth, or sixth grade children. It tells what has caused the land to be barren (water, winds, over grazing). It also tells of ways to bring it back to health by resting the land, planting to grass, limiting grazing, dams, etc.

Written in the style of the poem "Hiawatha," children would like it.

Planning and Planting the Indiana Farmstead, Hull, R. B. Purdue University, Department of Agricultural Extension, Lafayette. Bulletin 178. May 1931. 35 p. illus.

The Indiana farm family has many advantages in favor of

a fine development of the farmstead. Space, surrounding country, good soil, and native trees and shrubs all play a large part in planning a pleasant living place. Proper development of the farmstead requires time and planning. The location of the dwelling, area around the house, the barnyard, walks and drives should be considered in any such planning. Suggestions as to where to place trees, shrubs, and vines, and the best kinds to use are given.

Practically all farm families are interested in improvement of the farmstead, both from the standpoint of increasing the pleasures of country living and that of enhancing the real estate value of the farm. This bulletin would be very helpful to farmers in Indiana and surrounding areas, and to city dwellers because it gives native trees, shrubs, vines, and flowers which may be had for the labor of collecting and planting them.

Public Land Acquisition, Part 1 Rural Lands; National Resources Planning Board, Land Committee; Government Printing Office, Washington. June 1940. 24 p.

The central aim of the national land policy is to enable man to derive from the land the maximum benefit and satisfaction consistent with the permanent maintenance of that resource. Accompanying these benefits there have been a number of undersirable effects, such as a great wastage of soil and timber, and the development of excessive tenancy and rural slums. Land acquisition has today become one instrument, and a basic one, among many for the effective conservation development and wise use of the nation's resources. In keeping with the American ideal of private ownership, public

policy limits land acquisition to the scale necessary for accomplishing definitely planned land-use programs. Objectives of such a program are the preservation and development of resources (soil, forests, coal), preservation and rehabilitation of human resources, reduction of expenditures for public services and relief, provision of sites for public buildings, preservation of scenic, historical, and scientific sites. Public benefits should be considered not only in terms of direct money returns, but also in terms of community values (not always precisely determinate), in terms of human values and their contributions, in terms of savings in public funds, and in regional or national terms. Policies guiding this program are lands now in private ownership (managed on a conservation basis), which are not profitable, lands which constitute a serious hazard to surrounding areas, lands that are operated (privately) profitably only through rapid depletion of productivity, and lands necessary for certain projects. Land-use programs involving land acquisition are National Parks, conservation of forests and protection of watersheds, conservation of wildlife, and purchases for Indians. Land acquisition frequently results in some population movement. The administrative agency has some responsibility for aiding the people who must move to become favorably reestablished. Factors affecting the character and extent of this responsibility are the rate at which the movement must be accomplished and the degree of assistance required.

This report clearly states the objectives of land acquisition by governmental agencies, the social and economic

aspects involved, and the uses to which the acquired lands are put. The report is intended for the National Resources Planning Board for inclusion in its public works programs and projects, but for the interested reader it gives a clear picture of what governmental agencies plan to do with acquired lands.

Public Land Acquisition, Part 2: Urban Lands, National Resources Planning Board, Land Committee; Government Printing Office, Washington. February 1941. 86 p.

The basic maladjustment behind most urban land problems today lies in the irrationality of urban patterns. It had been assumed that urban growth would continue indefinitely, and that expansion and booming of land values would, in time, introduce order and correct errors of the past. Around the core of most American cities today, there is an area of declining housing and marginal business, and area losing population and value, an area obsolescing both as to location and function. This is called a blighted area. At the other end of the urban radius cities have been plagued periodically with epidemics of wildcat speculation and premature subdivisions. High municipal overhead and tax delinquency are other indicators of "submarginality" of urban land. Types of control now in use in zoning, control of subdivisions and plats, building and plumbing codes, subsidies and inducements, taxes, and public ownership (one of the most promising methods). The principal objectives served by public land acquisition are sites for public buildings and enterprises, and for land-use control. Land is acquired by purchase, condemnation, tax reversion, mortage foreclosure, gift, exchange, long-term lease,

and reclamation. Fiscal, economic, and administrative requirements are many and complex. Land planning and acquisition will be called upon to play a larger role in the city in the future.

This report on urban lands is a comprehensive treatment of the problems of urban land acquisition. It is concerned with the ground-work for the formulation of useful and flexible tools for urban land planning. It emphasizes the need for coordinating units within the Federal Government with city agencies concerned with effective redevelopment of our cities. It is especially planned for use by cities in adjusting their existing problems and needs.

Rich Land, Poor Land, Chase, Stuart; Whittlesey House, New York. 1936. 352 p. illus.

The North American continent before the coming of the white man was rich in growing things, incredibly beautiful, and perhaps one of the most bountifully endowed of all the continents. Forests, grasses, and wildlife were at the maximum of their vitality; deserts were at a minimum. In 300 years we find this continent vastly changed. The old forests and grasslands have almost completely disappeared; deserts have broadened; continental soil is visibly and rapidly declining; forest cover has been stripped, burned and steadily shrinks; rain and snow rush to rivers; floods and droughts grow worse; wildlife is rapidly declining; minerals have been depleted. If such devastation continues at the same rate in the future there can be only one end. We must decide whether we can keep an advanced technology and yet come to terms with nature. An equilibrium must be

determined and it must be planned. America has reached its relatively high standard of living on its resource capital. The various resource areas and what has happened are under the captions (1) croplands, (2) grasslands, (3) forest-lands, (4) watersheds, (5) wildlife, and (6) minerals. To meet the problems we must plan. The TVA is the first comprehensive program of planning with nature ever attempted in the United States. We need more regional planning. Theodore Roosevelt started the conservation movement. F. D. Roosevelt gave new impetus as evidenced by activities of the C.C.C., Soil Conservation Service, etc. America has reached maturity in business. Public works and services can use the surplus labor. But we must convince the people of the need and rightness of this.

This survey of America's natural resources makes facts and figures vital and dramatic. It is as interesting and readable as a novel. In spite of the discouraging story it tells, it is definitely one that all should know.

Written for the layman, it should be required reading for all colleges, clubs and adult organizations to acquaint them with conservation and what is needed.

Save the Soil, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol. 29, No. 4. March 1936. 32 p. illus.

The physical nature of soil, the slope of the land, the quantity of rain and when it falls, the distribution of water through the soil, wind, temperature, soil cover, and uses made of the soil all enter into problems of conservation.

Fine particles of soil are more easily washed away than

are larger particles. Slope and cultivation up and down hill cause great soil loss. In a humid climate, such as New York's, greatest soil loss is through washing by water. About four months of the year in New York the ground is frozen, and little soil is lost. The speed with which water moves determines the damage done. Plants do much to hold soil. They resist the action of wind, water, and help hold the water which falls. This is true of forests and grasslands. Plants along roadside banks prevent washing; this is good economy because of the expense of keeping roads. Much steep land which has been cleared should be returned to forests, not only for lumber, but for control of erosion and to regulate stream flow. Burdened by taxes and other expenses, farmers are forced to obtain from the soil all the immediate returns they can. However, fertility cannot be maintained if soils are exhausted by unwise use and by erosion.

This leaflet is primarily for teacher use, but parts could be used by pupils above the fourth grade. The material helps one understand the underlying principles of conservation, and some of the Federal and State programs for conserving soil. Experiments for measuring ruh-off in various kinds of soil, use of a rain guage, and measuring land slope are given.

Saving Our Soil, Stewart, Maxwell S.; Public Affairs Committee, Inc.; New York City. No. 14. 1937. 31 p.

Three centuries ago, North America was a virgin continent. Its wealth seemed inexhaustible. Today, many of these riches are greatly reduced. The depletion of the soil, and to a lesser extent, the destructiveness of floods, are indirect

results of man's activities. Erosion is caused by water and wind.

We cannot replace the tons of fertile top soil which have been washed into the ocean. Nor can we wholly stop the natural process of erosion. It is within our power to reduce these losses to moderate proportions. The Soil Conservation Service is conducting 174 demonstration projects in 45 states to give farmers aid in conservation practices. The National Resources Board has surveyed the problem and made suggestions with regard to the broad policies which the country should adopt. The immediate responsibility lies in the hands of millions of individual farmers. The suggestions to these farmers include a planned farm, grass crops, rotation of crops, contour tillage and terracing, strip cropping, and winter cover for all fields. Reforestation on a large scale is primarily for the state and national government rather than the individual.

Control of erosion is an important means of preventing floods. Check-dams, ponds, reservoirs, swamps and marshes, upstream control by dams and levees are means of conserving our water resources.

A national program of control for erosion and floods is needed. Some objectives have already been partially carried out, but we have not yet begun to meet the challenge of erosion.

This report discusses, in simple and interesting form, the various causes of erosion, methods of control and what has been done up to 1937. It is excellent material and parts can be used as a textbook by some sixth graders, and junior

high school students.

Soil and Wildlife Conservation, Le Compte, E. Lee, Conservation Department, Game Division, Baltimore Maryland. April 5, 1938. 3 p.

Economic as well as aesthetic factors are concerned in the conservation of our wildlife. Soil erosion has destroyed thousands of acres of land. The planting of legumes and grasses on slopes as well as bottom land areas helps to prevent erosion. Many woody plants are valuable in checking erosion. And, these plants--grasses, legumes, trees, and shrubs provide food for wildlife. The more birds a farmer attracts to his property, the less difficulty he has in growing crops, as the majority of birds are beneficial to the farm interest in destroying obnoxious weeds, seeds and insects. Cited are the foods eaten by bobwhite, robin, meadow lark, king bird, purple martin, and others which are beneficial to the farmer.

This address, given over the radio, endeavors to show the farmer some of the benefits he receives when he aids wildlife by leaving fence-rows in growth, and plants food and manages his woodlots so that wildlife can exist. It is convincing, as far as it goes, but fails to consider some of the problems of the farmer (weed control, hunters, etc.).

Soil Conservation, Bennett, Hugh H.; McGraw-Hill Book Company, New York. 1939. 958 p. illus.

Surveys made in 1934 showed that 50 million acres of cropland in the United States were virtually useless; another 150 million acres of arable land has declined far enough to

make farming unprofitable. The combination of dashing rains and vast acreages in croplands makes the United States susceptible to erosion. Erosion impoverishes not only the land but those who live on the land, and areas dependent upon the welfare of the farmer. Water erosion is conditioned by factors of slope, soil type, land use, and amount and intensity of rainfall. Wind erosion is an acute problem in areas of low rainfall. A dense cover of vegetation is the most powerful practical weapon known for reducing erosion and run-off. In planning suitable soil conserving practices, all phases of the general problem must be analyzed from the climatic view-point. Mass movement and insect population are important indirect causes of erosion. Methods for increasing infiltration are cultivation, vegetative cover, adding organic matter, contouring, terracing, and strip cropping. The basic principles of close growing vegetation effective in checking soil and water losses are (1) reduces direct impact of rain on soil surface, (2) speed of run-off is checked, (3) organic matter increase improves water-holding capacity. Grasses and leguminous plants suitable for erosional control are listed. Forests and their management have a definite place in soil and water conservation. Gully control, highway erosion, stream banks, and related topics are fully discussed. Wildlife management and soil conservation are closely related; the benefits are reciprocal. Problems peculiar to various areas and efforts to control and reduce erosion are described. Erosion problems in foreign countries are being met in various ways.

Throughout this very detailed account one is impressed

by the many fields into which land problems reach. The erosion process, the physical, economic, social, and human welfare aspects of the problem, the techniques, plans, and programs for soil and water conservation, and the results obtained are of vital importance. The work of the Soil Conservation Service is described in detail.

This volume contains a wealth of authentic material and should be indispensable to agricultural colleges and experimental stations. For intelligent farmers it contains graphs, charts and drawings, and gives specific measurements and instructions for construction and use of certain techniques. For all adults it gives a concise picture of what the erosion problem is, and ways in which it can be reduced and controlled.

Soil Conservation, United States Department of Agriculture, Soil Conservation Service, Washington.

This magazine is issued monthly. It supplies workers and cooperators of the Department of Agriculture engaged in soil conservation activities information of especial help to them in the performance of their duties. It contains much of interest to farmers and conservation groups outside the Department. The articles are interestingly written and are usually non-technical.

The magazine is issued free to workers within the Department; subscription price is $1.00 a year, or 10¢ a copy.

Soil Conservation and National Defense, Bennett, H. H. United States Department of Agriculture, Soil Conservation Service, Washington. 1940. 20 p. mimeo.

This address given before the Forest Preserve Associa-

tion of New York stresses the importance of the defense of the productive soil against the forces of exploitation and waste. In times of war many are of the opinion that conservation is a desirable but not particularly pressing kind of work. War is waged on many fronts--agricultural included.

We have an abundance of land but not enough high-quality, erosion-resistant land to waste any of it. Erosion is carrying off three billion tons of soil each year. The products of erosion (bottom lands covered with sand, stream channels and harbors clogged, reservoirs filled, highway and rail maintenance, flood destruction) are costing a tremendous sum. Somehow these things must be brought in a purposeful way to all Americans. The Soil Conservation Service has been lending direct aid to farmers and ranchers since 1933. Projects near Temple, Texas are described. There is great need for progressive education in the field of soil conservation and wise land use. Through the schools, forums, literature, radio, newspapers, and magazines, this great problem can be brought before the public.

The correlation between soil conservation and national security is generally overlooked. It is fully as important as military and industrial matters. Statistics in this address bring out the immensity and importance of conservation.

This could be used by high school or college students for the problem is clearly stated.

Soil Conservation Districts in Kentucky, State Soil Conservation Committee, Frankfort. Bulletin No. 1. March 1943. 45 p. illus.

Conservative estimates indicate that normally Kentucky's annual loss in plant foods removed by erosion is at least $34,000,000.00. This is in addition to the loss of the top-soil itself. Many of the soil conservation problems of this state are of a nature which require cooperative action. By December 1942, eighteen Soil Conservation districts, containing over 3,000,000 acres of land, had been organized in Kentucky. The progress in each district is reported--acreage terraced, drained improved pasturage land, contour cultivation established, and trees planted on land not suited for other use. The operation of the districts is described. The fundamental practices which districts are assisting farmers to apply on their farms include (1) selecting land that is adapted to the use to which it is to be put; (2) supplying the soil amendments that yield crop increases; (3) establishing and improving meadows and pastures; (4) controlling erosion and leaching losses; (5) improving drainage facilities; (6) managing farm woodland; (7) developing farm reservoirs; (8) protecting and encouraging the developement of wildlife resources.

This bulletin describes the program and accomplishments of the Soil Conservation Service in Kentucky. Farmers not organized should be interested in this report.

Soil Conservation For the Week-end Driver, Consumer's Guide, Vol. 7. No. 14. April 15, 1941. pp. 11-14.

This article gives, briefly, conservation practices we can recognize as we pass through almost any countryside (strip cropping, terraces, forest litter, contour planting, dams).

On a fourth grade level, this might be read and practiced

by any family out for a Sunday ride. If children and their parents are aware of the situation they can readily recognize soil wastage round about them.

Soil Conservation in the Junior High School, Strong, Helen M. Secondary Education, Vol. 10. No. 1. February 1941. pp. 29 -30.

Everyone knows that food comes from the soil, but few if any city people consider the farms and ranches that contribute to its production. City dwellers have slight awareness of the immediate or remote common interest in top-soil. Even the farmer who is losing many tons of top-soil each year from his land may not realize his loss. The fact that declining fertility was due not to something gone from the soil but to lack of top-soil itself was not recognized until recent years.

Farm boys and girls can be taught in terms of their own community. For the city boys and girls the approach likewise is in terms of something they know and in which they are interested. This kind of teaching calls for community study by the teacher first, and then by the pupil and teacher.

This is an excellent article for any teacher to read. It gives an insight to the problem--both in rural and urban communities.

Soil, Its Use and Conservation, Graves, Geo. W. Science Guide for Elementary Schools, Vol. 4. No. 2. September 1937. 54 p.

Soil is not merely "dirt," but is a composition of rock particles, air, water, and organic matter called humus. Soils are formed from rock, decomposition of plants and animals,

weathering, living organisms, and chemical action. Soils are classified by either origin or texture. Without soil, plant life would be impossible.

Man's use of soil has wasted or improperly utilized the natural and interdependent resources of the soil, forests, grasslands, and water. Nature's balance was upset and the soil exposed to the action of wind, melting snow, rain; and flowing water changes an erosive process which was normal under a vegetative cover, to one which is abnormal and destructive. The kinds of water erosion and wind erosion are described. Methods of control may involve whole watersheds embracing thousands of acres, or a portion of a single farm. The methods discussed are (1) check dams, (2) gully planting, (3) terracing, (4) changes in methods of tillage, (5) changes in land use. The agency concerned with control is the Soil Conservation Service. California has several demonstration areas. A list of plants for erosion control in California is given.

The unit on soil conservation carried out by a seventh and eighth grade is adaptable to other grades. The possible approaches and content are excellent. The activities are varied and well integrated with science, social studies and English. The bibliography for teachers is adequate, but limited for the pupils.

This bulletin for teachers assembles the material in a form suitable for teaching in the elementary grades. This should be most helpful in the teaching of soils and their relation to erosion and conservation.

Soil, The Nation's Basic Heritage, United States Department

of Agriculture, Land-grant Colleges, TVA; Washington. Undated. 59 p. illus.

This bulletin is a description of what is happening in the Tennessee Valley, and of how agricultural forces in the land-grant colleges and universities of the seven Valley States, the United States Department of Agriculture, and the TVA are encouraging conservation of soil and the restoration of its fertility.

In the Tennessee Valley dams are being constructed to collect water during heavy rainfall periods. By such collections the dams will help prevent floods and by letting it out gradually in dry periods it will aid navigation. Turbines generate electricity which aids the farmer at scores of tasks. But no matter how hard engineers work at building dams, the big problem of providing natural water storage on private land remains. Of all the farm land in the Tennessee Valley, careful estimates show more than a million acres have been destroyed for future use. Plowed unplanted land suffers most from erosion; open-tilled corn lands next; alfalfa and grass planted areas suffer least from both soil or water loss. Cover is indeed the secret to land conservation. Replanting open land to forest, planting land to permanent pastures, terracing, winter cover and rotation are effective methods of control.

The usefulness of TVA's concrete dams is being protected by cover crops in the fields to prevent silting. Good farming is just as essential to the full development of the Tennessee Valley as Wilson, Norris, or other big dams.

This attractive booklet contains information about the

Tennessee Valley and how it is being restored. The photographs are excellent. The economic and social aspects of flooded, eroded areas are stressed, and how scientific research and planning may bring a return of wealth and happiness to the people there. For adults, this material is excellent.

Soils and Security, Bennett, H. H. United Stated Department of Agriculture, Soil Conservation Service, Washington. 1941. 35 p. illus.

Soils have been on the move since the beginning of time, but no faster than the normal rate of soil creation until population pressures forced the cultivation of steep slopes or unstable soils.

In North Africa, China, and Western Europe every effort was made to hold erosion in check. In recent years programs for land improvement and conservation have been put into effect. In the United States a mighty civilization was built in a very short time but at an unprecedented cost in basic natural resources.

A Survey made in 1934 showed that in the United States 14% of the land is essentially ruined for further cultivation and another 35% is already seriously affected. The causes given are (1) seemingly unlimited supply of land, (2) character of our climate and conformation of surface, (3) large amount of land under cultivation. The effects are (1) we face a serious land shortage, (2) declining standard of living for millions of farmers, (3) farming more costly, (4) flood problem is aggravated, and (5)reservoirs, navigable streams, irrigation ditches, etc. are being filled up.

The Soil Conservation Service has been successful in working with farmers to check or stop erosion. Specific treatment is varied to meet particular conditions.

This is a forcefully written phamplet on the effect of erosion in relation to our economic national security. It could be used by high school students in the study of the far reaching results and cost of soil erosion.

Soils and Soil Conservation, (A Manual of Conservation for Missouri Teachers) No. 2, Missouri Conservation Commission, Jefferson City. 1940. 31 p.

The subject matter of the unit includes excellent material on soil--its composition, kinds, agencies that form and transport soil, soil water, factors which damage soil, land use practices responsible for erosion, results of erosion and ways of controlling erosion. Ways of improving soil are given. Conservation of soil in relation to water, forests, wildlife and mineral resources are briefly discussed.

Pupil activities include testing mineral content, comparison of texture, effects of cultivation on absorption of water, evaporation, etc.

The unit probably could be used most successfully in a secondary rural school. It would have little meaning and no appeal to a city group unless ample provision was made for much field work. The bibliography listed is for teacher use and is primarily one of agricultural material.

Soils, Minerals, and Nutrition, Forman, Jonathon, reprint from Ohio Schools, Vol. 20. No. 2, State Department of Education, Conservation Labratory, Columbus. February 1942. pp. 58-59

In virgin soil there are some score of minerals. Those that are found even in the minutest trace play a vital part in the nutrition of plants, animals, and human beings. A deficiency of vital minerals has resulted because of over-refining of foodstuffs or the depletion of soil through bad farming practices. All should make it a duty to help the farmer put sound conservation practices into effect. The Ohio State Department of Education and the Division of Conservation and Natural Resources have established a course of conservation in the public schools. Teachers of Ohio have opportunity to take a six weeks summer course in conservation (all phases).

This article, by a physician, tells of the body's need for minerals, and how these have been depleted by improper farming practices.

For parents and teachers, the article touches on one of the fundamentals necessary to the health of our children and pupils.

Soil, Water, and Man, Deusing, Murl; (Basic Social Education Series), Row, Peterson & Company, New York City. 1941. 47 p. illus.

In dramatic story form floods and dust storms are described. The abuses of our land by fur traders, pioneers, farmers, and lumbermen have left miles of cutover land, scarred and gullied. With no natural cover, the lands had no protection against floods. The hydrologic cycle is simply explained in words and diagrams. Planning to prevent floods includes the building of dams, reservoirs, levees, tree-planting and intelligent agriculture. The large herds of

cattle and sheep, and plowing of grasslands explain the story of the dust bowl. To prevent erosion the Soil Conservation Service is working with farmers to encourage contour farming, terracing, strip-cropping, gully control, and other practices.

This is an elementary presentation of what is happening to our soils as a result of wind and water erosion. It is simply written, and the material is very interesting to children. It is closely related to United States geography and to science work. The pictures are excellent and beautifully colored. This material is usable with a fifth grade.

The Land, published by Friends of the Land, Washington. illus.

This magazine, published quarterly, is concerned with the conservation of soil, rain, and man. The material is interesting and informative. Primarily for the farmer, the practical agronomist, or conservationist interested in soil and water, it has many items of interest for the average reader, also.

Membership dues to Friends of the Land (receive The Land, The Land Letter, and other services) is $5.00 per year.

The Land Letter, published by Friends of the Land, Washington, illus.

This magazine is a supplement to "The Land" (a quarterly magazine) and contains timely articles and news-notes of activities in connection with conservation of the soil and water. Prominent conservationists contribute authentic and interesting material. Of special interest to farmers, others also will enjoy it.

The Land We Defend, Bennett, H. H. United States Department

of Agriculture, Soil Conservation Service, Washington. 1940; 14 p.

This address, given before the N.E.A. at Milwaukee, gives a picture of what is happening and what has happened to our land. Few people realize what soil erosion has cost,is costing the nation--840 million dollars a year. The cost, in terms of highway maintenance alone is 180 million dollars annually.

The dust storms of the 1930's, the costs of erosion, the results in terms of clogged stream channels, etc. must somehow be brought before the attention of all Americans. It is high time to introduce into our schools courses which deal with the soil as a resource basic to continuing national welfare--as a resource that must be preserved.

In 1933 the Soil Conservation Service was established to see what could be done to control erosion. The Service works with the farmer to develop a practical coordinated plan for applying the best known methods of rainfall conservation and erosion control to his different kinds of land. A description of the way the program works in 600 farms near Temple, Texas is given. Nearly every kind of erosion encountered can either be remedied or effectively controlled.

There is need for continued and comprehensive research. This is a challenge to educators; there is a need for progressive education in the field of soil conservation and wise land use.

This is a phamplet which should be read by all in the educational field. It points out the great need of bringing to the American public, this immense and vital subject. Ed-

ucation is one way of approaching the problem.

Thirst On The Land, Vogt, William; National Association of Audubon Societies, New York City; Circular 31. Undated. 31 p. illus.

The marshes and swamps of the United States are a source of national wealth of the first magnitude. We have destroyed water resources, and are continuing to destroy them by drainage projects. These marsh and swamp areas are important in the maintenance of water levels; marsh drainage causes shrinkage in the soil; loss of water increases the expense of agriculture and thus to every purchaser of food; in many drained areas wildlife and vegetation is destroyed.

Practically all the draining of salt marshes has been for the avowed purpose of mosquito control. Change in vegetation, wiping out plant and animal life result, yet other methods (besides drainage) are feasible. Inland, many acres have been drained for malaria control. That some drainage is not only justifiable, but necessary, is conceded. However, much such work is needless and destructive, and does not accomplish the goal anticipated.

The remedy for such destruction lies in (1) careful evaluation of all swamp and marsh areas (all aspects of their relationship to man, including fur, fish, oyster beds and water supply); (2) methods modified to reduce destruction; (3) program of basic research for mosquito control; (4) trained ecologist to recommend projected drainage operations; (5) active educational program in connection with projects.

This phamplet describes the waste of one of our resources and how this waste may be curtailed. It should focus public

attention on drainage policies and should prove a factor in developing public opinion against continuance of such policies.

To Hold This Soil, Lord, Russell, United States Department of Agriculture, Pub. No. 321. Washington. August 1938. 122 p. illus.

This phamplet outlines the problem as a whole, exhibits working combinations of control in different parts of the country, and emphasizes principles. Accelerated erosion can be controlled. The practical and immediate way to do it is to combine the cheapest and most appropriate measures into rearranged management plans, farm by farm. The same devices of control are used nearly everywhere but with endless variations. We must change our ways of land use.

This phamplet tells the history of land use and the resulting conditions in all areas of the country. The quotations telling what different sections of our country were once like are most interesting and indicate the great need for some action. The work being done by the Soil Conservation Service and its agencies arouses hope. The discussion of the causes of erosion (seemingly unlimited land, pressure brought about by the great need for more food in World War 1, unwillingness to recognize first symptoms, etc.) helps the reader to understand the immensity of the problem.

This would be an excellent source book for use in secondary schools concerned with the study of conservation problems (why our country faces such a situation, practices which brought it about, what is being accomplished, and methods of attack). The bibliography listed is late material

by outstanding writers.

What is Soil Erosion, Sharpe, C. F. Stewart; United States Department of Agriculture, Soil Conservation Service, Washington. (Misc. Pub. No. 286) 1938. 85 p. illus.

Soil erosion is a special type of the general erosion which has sculptured the lands. When land is cleared of its natural cover of vegetation, when soils are bared by overgrazing or fire, exposure to direct attacks of wind and rain from which the soil has been protected for thousands of years, induces erosion of an entirely different order. This process is designated as "accelerated erosion," "man induced erosion," or "soil erosion."

Erosion by rainfall and running water is negligible where the vegetative cover is intact. Little vegetal litter, overgrazing and fire result in sheet erosion, gullies, etc.

Mass movements of the soil and ground moisture have direct connection. This should be understood before irrigation or other increase of soil moisture is made. Slump, earthflows, caving, soil creep, slides and mudflows are fully discussed.

Erosion by wind is important only in areas where there is insufficient vegetation to bind the soil. Sand dunes, drifting topsoil, etc. are discussed with ways of combating given.

Ever since cultivation began in this country, soil erosion has steadily sapped the vitality of the land. Lands must be built up--the soil conserved. To accomplish this we must work hand in hand with nature and use strategy based on knowledge of the natural processes.

This bulletin discussing both natural and accelerated erosion clarifies our understanding of the erosion processes and aids in our analysis of the problems of soil erosion control and land use.

Written on a high school level, this would be an excellent handbook for the study of the kinds of erosion, factors causing erosion and aids in controlling erosion. The photographs are very helpful.

Youth and the Soil, United States Department of Agriculture, Soil Conservation Service, Region Seven, Lincoln, Nebraska. June 1940. 65 p. illus.

The problem of rural reconstruction in the United States is essentially a problem of economics and planned land use. All agencies--business, professions, labor, education--must take an interest in it. Certainly education will be less effective without the cooperative assistance of other agencies. Insofar as the teacher-training institution can train its teachers more effectively in the rural areas that it serves, it should do so. State Teachers College at Mayville, North Dakota has been working on a program for its prospective teachers whereby they are better fitted to help in rural reconstruction. The program of conservation education necessarily began with soil, for that is the source of the major part of the wealth of that area.

The units are worked out for grades one to eight. In each unit the activities are generally field trips or experiments whereby the children actually see or experience the conditions of the community. The subject matter content is well organized. References are not defined as whether for

teacher or pupil, and if intended for children, they are entirely too difficult.

Also included is a complete plan covering the entire subject of soil conservation. The teacher may get a full outline of the whole subject and adapt it to elementary, high school, or college level. This plan should be most helpful.

The visual aids for teaching are excellent. Film strips available on loan from the Soil Conservation Service, 16 mm. sound and silent movies, photographs, slides, Conservation Charts (free from United States Department of Agriculture) and government publications are listed.

FOREST RESOURCES

America's Forests, American Forest Products Industries, Inc., 1319 Eighteenth St., Washington, D. C. 1941 44 p. illus.

This booklet gives the history of America from a different viewpoint. It tells how forests have influenced America's colonization and development. Beginning with the coming of Lief Eric about 982, it describes the early settlements of Plymouth and Jamestown and the forest products which were so valuable to England. Sawmills were built and working; the forest was the beginning of American manufacturing enterprise. The North American colonists were excited and amazed by the wealth of the forests. Native to this country were over 1100 species of trees; England has only 29; France 34. The forest provided man with shelter, fuel, weapons, tools, food, clothing--and still does.

The first need of the developing country was lumber, and the supply seemed endless. Times have changed. Now we know that we must work to product an ever-replenished tree crop. Permanent forest industries are essential to national welfare. Improved forest practices are being encouraged among forest owners. The usefulness of the forest crop is ever increasing--(plywoods, veneers, cellulose fibers, paper products, wood plastics, solvents, dyes, etc.).

Practically all the booklet is written on a fifth or sixth grade level. It is interestingly told and would

appeal to a group making a study of trees, wood products or the history of North America. It concerns history with which every child is familiar, but from a different approach. I believe it would be of great interest to almost any group as a supplementary reader.

Arbor Day, United States Department of Agriculture, Washington, Farmer's Bulletin No. 1492. September 1940. 32 p. illus.

Arbor Day is purely American in origin, and grew out of conditions peculiar to the Great Plains, a country practically treeless but supporting a flourishing agriculture with a soil and climate well able to nourish tree growth. It was first observed in Nebraska in 1872 by J. Sterling Marton, then a member of the State Board of Agriculture, later U. S. Secretary of Agriculture. Tree planting was no new thing in Nebraska, but the adoption of the Arbor Day plan meant organization of the work and the state became known as the Tree Planter's State. Kansas and Tennessee followed Nebraska's lead and by 1885 the plan had spread through many states as an educational festival. It is now used throughout the U. S. and many foreign countries. The observance of Arbor Day has broadened in scope with increasing interest in the wise use of all our natural resources. Instead of being limited to one day's program, the Day often ushers in a whole week devoted to conservation of all resources. The time of observance varies (a table of time and provisions of state law is given). The celebration of Arbor Day is the assumption of an all year-round responsibility, since subsequent care must be assigned

to individuals or organizations. It leads to greater appreciation of the beauty and civic values of trees and shrubs.

Certainly, any group planning to celebrate Arbor Day should recognize something of its background and purpose. This handbook is designed for teacher or laymen to fill that need. No suggestive ceremony or outline for observance is given, but the leader of any group participating in such a plan could use this as a basic material to plan a program. In schools also, it would be helpful or as a content of subject matter in a study of trees.

"As the twig is bent," An Adventure in Conservation Teaching, State Conservation Department, Milwaukee, Wisconsin, November 1940. 14 p. illus.

This bulletin is composed of children's own accounts of their study of trees. The class (grades 1, 2) was studying their community. They were greatly interested in the fire department and talked much of fire prevention. They talked about preventing forest fires, too. The question arose as to why it was important to prevent forest fires. To answer the question the children began to study trees. They learned about rangers, fire towers; they wrote stories, poems, and songs about trees; they carried out experiments; they visited a newspaper and a lumberyard to learn the uses of trees; they visited a nursery, a park and a conservatory to learn how trees grow.

This account tells of the children's learning in their own community, and the resulting desirable attitudes toward conservation. It is excellent to show what can be

done with young pupils. It should be very suggestive for the teacher of lower grades.

Behind the Eagle Stand the Forests, Timber Engineering Company, 1319 Eighteenth St., Washington, D. C. 1941 28 p. illus.

This is a pictorial presentation of the uses of wood in war time.

1) Army--barracks, laundries, portable bridges, hospitals, recreation centers, hangars, airplanes, packing boxes, etc.

2) Navy--barracks, mess halls, classrooms, furniture, keel timbers, trawlers, mine layers, patrol boats, spar timbers, etc.

3) Defense Housing--prefabricated houses, home for workers, one family and multiple units.

4) All industry--churches, theaters, piers, garages, oil derricks, fire look-outs, powder magazines, factories, etc.

The magazine shows the uses of wood. The pictures are small and the value of the publication is questionable.

Books and Other Publications Relating to Forests and Conservation, United States Department of Agriculture, Forest Service, Washington. Undated. 4 p. mimeo.

This is a list of informational books, bulletins, phamplets, and magazines on forests and the conservation of forests. The publications are of a date later than 1935 and should furnish good source material for teachers, students, and laymen interested in forestry.

Careers in Forestry, United States Department of Agriculture, Washington. Misc. Pub. No. 249. January 1938. 15 p.

The importance of proper training now and in the future for a career in the field of forestry cannot be overestimated. As the number of foresters steadily increases and competition becomes more keen, thorough education will become more and more necessary. College is but a part of the preparation needed. It must be supplemented by first-hand experience in forest or conservation work. Foresters are now employed by the Federal Government, by the States, by municipalities, by lumber companies, wood-using industries, by educational institutions and organizations conducting research in forestry. Industry, honesty, soundness of character and a liking for the sort of life which he must lead and the health and constitution to stand it are the most important personal requisites of the successful forester.

In this bulletin are described the various fields open to the forester, the character of the work and the training necessary. This could best be used in connection with vocational guidance in high schools or colleges.

Farm forest Facts, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol. 33, No. 2. November 1939. 32 p. illus.

In 1935, New York had 177,085 farms; of this 4,032,490 acres were in woodlands. Few of the owners knew enough about forestery to obtain the highest returns from these woodlands. A farm with a flourishing forest is more than a one-crop business. New York farm woodland, wisely

managed, may have a definite relationship to the productiveness of other croplands. They may yield direct revenue from cordwood, maple sugar, sawlogs, posts, hunting privileges, Christmas trees, and plants for ornamental landscaping. The forest floor, properly managed, encourages litter and humus, prevents soil erosion and water loss, and helps growth of new trees. To survive, trees must compete with other living things --caterpillars, ants, borers, beetles, rusts, and most destructive of all--fire. The multiple uses possible for forests--fur-bearing animals, flesh of animals (rabbits, squirrels, etc.), birds, fish, recreation facilities,--all are discussed.

The activities given in this leaflet are varied and worthwhile--the facts presented may be used by fifth and sixth grade children. The bulletin gives the economic values, as well as social and aesthetic. Much use is made of the community.

Forest Conservation in the Social Studies and Sciences, United States Department of Agriculture, Forest Service, Washington. 1940. 137 p.

This is a series of units on forest conservation for use in high schools. Unit 1 - Man Conserving the Forest--deals with the misuse of forest lands, services rendered man by forests, and the changes needed in forest management. Unit 2 - is a historical study of the conservation movement from colonial days through 1937. Unit 3 - The Forest, a Guardian of Land and Water --emphasizes forests as they influence water behavior,

soil, and wind erosion. Unit 4 - Fire, the Red Enemy of Forests--deals with the destructions caused by fire, how fires start, how controlled, and the work of fire fighters. Unit 5 - is on How Diseases and Insects Destroy the Forest. Discussed are the fungi, rusts and blights, insects as attackers, and their control. Unit 6 - is concerned with Managing Forests for Wildlife Crops. It deals with wildlife capacity, winter range, predation competition, preserves, refuges, etc.

With each unit is a list of possible approaches, activities, discussion questions, tests of evaluation and an excellent bibliography. The activities are varied and purposeful. The social and economic aspects are stressed in all units. For use in either biological or social study courses, they should be very suggestive to high school or college teachers and course of study committees.

Forest Trees and Forest Facts of Tennessee, Watkins, R. W., Bailey, J. L., Caldwell, J. C., Department of Conservation, State of Tennessee, Nashville. Bulletin No. 6. 1941. 2-79 pp.

Many things are wrong with the management of Tennessee's forests. They could have been managed so they would have continued to produce a supply of timber. Other values of forests are water conservation, wildlife recreation, and preventing waste lands. These have suffered and ways of restoring them are given.

A simple key and description of trees found in Tennessee is given.

This bulletin gives a very good discussion of the tree, it parts, and how it grows, as well as the conditions necessary for forest growth.

Parts of it could be used by elementary schools (fifth and sixth grades) and would be most effective in the teaching of the values of forests.

Forest Trees of Arkansas, Buchholz, J. T. and Mattoon, W. R. College of Agriculture, University of Arkansas, Fayetteville. Extension Circular 180. November 1924. 84 p. illus.

The increasing interest in outdoor life, and the widened outlook resulting from the spread of education encourages the rational treatment of our trees and forests. This handbook was prepared in response to a demand for information regarding the common forest trees. Altogether, 82 trees are described, with a brief mention of 33 other varieties or species native to the state.

As a handbook on how to know the common forest trees of Arkansas, this publication is very helpful. To be used for a basis of comparison of trees found in other states, it would also be helpful.

Forest Trees of Kentucky, Kentucky State Forest Service, Frankfort. Bulletin No. 6. 1931. 76 p. illus.

Five-sixths of Kentucky's original timber stand is gone; the remaining one-sixth is largely in scattered or culled stands, remaining from former lumbering operations. The lumber industry still ranks fourth

from the top among the soil crops in our state. There is a great deal of land in the rougher parts of Kentucky that will yield little or nothing in any other crops than forest trees. Yet this land is being allowed to become unproductive through neglect. The forest land of the state is losing its capacity to reproduce valuable timber because of forest fires, and wasteful methods of cutting. Kentucky can come into her own as a forest state only by stopping the annual waste by forest fires, and cutting practices.

The bulletin describes seventy species of native trees. It is intended to give a brief and usable guide to the trees of Kentucky so that Kentucky may know something of their state's forest resources.

Forestry, United States Government Printing Office, Superintendent of Documents, Washington. Price List 43--33rd Edition. May 1939. 20 p.

The publications included in this list are those concerned with forestry--tree planting, lumber and timber, ranges, wood preservation. Much of the material might be used with fifth or sixth grades and higher levels. The prices are nominal.

Forestry of 4-H Clubs, Mattoon, W. R., and Shinn, E. H., United States Department of Agriculture, Washington. Misc. Pub. No. 395. January 1941. 50 p. illus.

This publication suggests forestry projects which may be carried out by 4-H Clubs or other rural groups, or by urban nature study groups. The projects emphasize getting acquainted with forest trees and learning their value to

their owners and the community. Some of the projects deal with phases of managing farm home woodlots, farm forestry with respect to local forest trees and their uses, protecting and improving woodlands, planting trees, farm timber products, measuring and marketing timber, etc. The projects give sources of material and illustrative material, guides to study and practical activities to be carried out.

As a guide for a director of 4-H Club activities this material is excellent. It could well be used by leaders of boy's camps, nature study groups, and others interested in farm forestry. The bibliography would be useful to any group studying trees, their uses and management. The Key to Common Trees would be valuable to those who have had no special training in botany.

Grandeur of the Mighty Tree, Emergency Conservation Committee, New York City. Pub. No. 62. February 1937. 4 p illus.

Washington is permitting its few remaining tracts of virgin forests to be destroyed. This irreplacable asset is being wiped off the earth forever, for a few paltry dollars. Greed is at the bottom of our problem of saving our woods. These forests serve not only as wonderful living museums instructing the public about our out-of-doors at its best, but as nature's cathedrals where the overstressed and weary can find calm peace, and beauty.

This leaflet is a plea, to the public, to save the primeval forests of our country, in this case Mt. Olympus

National Park in Washington. The problem is forcefully set forth, and if the leaflet received wide enough circulation, it may have accomplished its purpose.

Hardy Shrubs, Halligan, C. P., Michigan State College, Agricultural Experiment Station, East Lansing. Special Bulletin No. 154. May 1926. 7½ p. illus.

Hardy ornamental shrubs are most desirable in beautifying surroundings. They possess body as well as bloom and may create shelter as well as shade. They are useful in softening and harmonizing the harsh line effects of the house, beautify corners and boundaries of the lawn, screen objects or scenes which are not attractive nor in unity with the general beauty of the grounds.

Success in growing shrubs is measured largely by the hardiness and adaptability to the conditions of soil and exposure. The climatic conditions of Michigan are so variable that many ornamental shrubs are sufficiently hardy for planting in some sections and not in others. A map indicates the hardiness of shrubs, and the sections of the state where shrubs of varying hardiness will grow. Descriptions of the shrubs include foliage, flowers, soil needed, and hardiness.

For homeowners interested in planting of shrubs around Michigan homes, this phamplet is an excellent guide.

Identification Key to the Fruits of the Trees of New Jersey, Scovell, E. L. New Jersey State College of Agriculture and Agricultural Experiment Station, Rutgers University, New Brunswick. June 1937. 16 p. mimeo.

This key gives a description of the various kinds of flowers and fruits found on trees. The key itself is very simple and easily understood. No scientific terms are used. This makes it usable with upper elementary pupils and non-trained adults in the identification of trees, not only in New Jersey but in most regions where deciduous trees are found.

Indiana Forestry Program Creates Future Timber, Aids Recreation, Indiana Department of Conservation, Division of Forestry, Indianapolis. Undated. 4 p. illus.

Indiana's state forestry program consists of (1) demonstration the possibilities and value of timber production on otherwise uncultivated lands; (2) promoting the growing of trees by protection from forest fire and classification of wooded tracts; (3) furnishing seedlings for reforestation. In the State Forests and Game Preserves shelter houses and drinking fountains provide facilities for persons who visit them. Artificial lakes provide fishing and recreation. Markers add to the educational use of forests.

This phamplet tells briefly of projects under way in conservation of forest lands in Indiana, and might be of interest to those concerned with conservation practices.

Indiana State Parks, Indiana Department of Conservation, Division of State Parks, Lands, and Waters, Indianapolis. Undated. 26 p. illus.

Described in this folder are the 16 state parks and

memorials found in Indiana. Their location, history, recreational facilities, and the nature study interests are given.

For vacation seekers, and nature study groups, this folder describes what Indiana has to offer. Teachers could use parts in connection with social studies for several places of historical note are given. The folder is on a reading level of fifth or sixth graders.

Kentucky's Forest Conditions Through the Camera, Kentucky State Forest Service, Frankfort. Bulletin 9. 1932 54 p. illus.

The pictures tell the story of the use and abuse of Kentucky's forests. They show the harvesting of lumber, forest damage, erosion, and corrective work of the Forest Service. The abuse and neglect can be remedied by education, fire prevention, and tree planting.

This bulletin is issued with the hope that it will aid citizens of the state to better understand forest conditions from an economic as well as aesthetic standpoint.

The pictures are excellent and could be used to advantage by schools in certain teaching.

List of Publications of the Conservation Department, New York State, Albany, N. Y. 1937 2 p. mimeo.

This list includes general information, bulletins on forestry and pest control, recreation facilities of state parks, biological surveys of various water sheds, stream pollution, and reports on water power projects.

Some of these publications would be useful to teachers, but since no annotations are given, each teacher would have to decide for herself. Much of the material is free or nominal in price.

Little Folks Forest Friends, Tennessee Department of Conservation, Nashville. Educ. Pub. No. 4. Undated. 12 p. illus.

This coloring book for use in first or second grade contains black and white drawings of forest animals, and ways of putting out fires (water, dirt). Under each picture is a sentence describing the picture.

Children would enjoy coloring the pictures, but would need authentic colored ones to go by. As supplemental work, it is very good.

Living and Forest Lands, United States Department of Agriculture, Washington. Misc. Pub. No. 388. 1940 48 p. illus.

Because of the many contributions of the forest to the welfare of both individuals and nations, forest conservation is of intense interest. Primitive man was dominated by the forest. The forest provided him with protection, food and shelter with little effort on his part. The forest kept him from wandering, from contact with others, and hence retarded his progress. When man progressed to the point where the forest no longer dominated him, increasing use of forest resources became necessary for his further progress. Soil, water, temperature, altitude and slope, prevailing winds and

ocean currents all have their influence on the forest which in turn affects our daily lives. Our uses of wood for food, fuel, clothing, domestic uses, illumination, communication and transportation, are examples of our great need for forests. Forests determine the locations of many industries because of raw materials and through their influence upon stream flow. The demand for lumber has decreased, but new uses such as pulp, rayon, cellulose, plastics have increased. Forests create commerce domestically and with foreign nations; they provide gainful employment to an average of 650,000 workers regularly; they play an ever increasingly important role in leisure activities. Forests should be considered as a renewable resource, and should be treated as crops. Reforestation may be natural, or artificial. Federal and state governments advise and help private owners as well as care for public forests. The benefits received justify this aid.

This bulletin is a guide to the social and economic aspects of forests and forestry. The principles of conservation are the bases for the report. The maps, tables, charts, etc., and the activities listed are helpful. The bibliography is good.

For use at junior or senior high level, the bulletin could well be used in a study of conservation, or in relation to geography or economics.

More Trees and Shrubs for Nebraska, Nebraska Game, Forestation and Parks Commission, Lincoln. Conservation Bulletin No. 1. Undated. 4 p. illus.

Nebraska was well blessed with shrubs which furnished

edible fruit for the food of wildlife in the early days. As a result of burning fence rows, putting more land under cultivation, and increased grazing of livestock the amount of wild fruits has been reduced to a marked degree. Such shrubs as Buffalo Berry, June Berry, Choke Berry, and others, should be increased and may be made to serve a three-fold purpose, that of furnishing a protective cover and food for wildlife, supplying food for the family, and helping to control soil erosion. Methods of propagating from seed are given.

Nebraska became known as the "Tree Planters' State" because many of its early settlers established many windbreaks, shelter belts, and woodlot plantings for their protection and for the benefit of future generations. While trees are being planted in Nebraska mainly for wind protection, they also act as barriers against soil erosion and evaporation of moisture. The best suited trees for Nebraska are listed, along with directions for planting a tree.

Written on a level which may be used by fifth or sixth grade, this article could be used to advantage, especially in Nebraska schools, in a study of erosion, conservation of water, or wildlife. Farmers, too, should benefit from it.

New Forest Frontiers, United States Department of Agriculture, Forest Service, Washington. Misc. Pub. No. 414. April 1941. 76 p. illus.

The great American paradox--serious want in the land of plenty--agriculture problems, unemployment, low standards

of living. These problems seem more acute because there are no new lands to move to. Fortunately some of our natural resources are renewable and can be managed for perpetual production. Forests are one of the most important renewable resources. They can be used for several major purposes at the same time so that their value and services are multiplied. Manufacture of useful products from forest materials provides employment for millions. The effort to rebuild, to capitalize on forest conservation as one means to rural and national rehabilitation must be directed on both private and public lands. Some problems facing this management are (1) wide variation in objectives between classes of ownership, (2) inadequate technical knowledge, (3) hazards of fire, insects, disease, (4) underdevelopment of new uses and markets for wood, (5) need for replanting idle acres, and numerous others. The American people are heavily dependent on forests for myriad products and services, for employment, and income, and for national defense. There is thus a public interest and responsibility for all land forestry regardless of ownership.

This bulletin presents the outlook of American forest problems--their social and economic aspects, and a possible solution through research and public cooperation. The pictures, maps, and graphs tell the story vividly. These could be used with fifth or sixth grade classes. The social and economic phases are such that junior high school students will profit. To be

used in civics, economics, or any other phase of modern problems, this material is well written.

Our Forests, United States Department of Agriculture, Forest Service, Washington. Misc. Pub. 162. July 1940. 38 p. illus.

A forest is considered as a community of plants and animals living in close association and in varying degrees of interdependence. The law of forests is the survival of the fittest. Given is a discussion of how a tree lives and grows. The forest regions of the United States are the northern, hardwood, southern, Rocky Mountains, and Pacific Coast. The kinds of trees growing in each region are discussed. The uses of forests are many--wood, paper, rayon, cellophane, plastics, rosin and turpentine, food, protection of water sheds and regulation of water supply, protection from winds, pleasure and recreation. Enemies of forests are fire, insects, diseases, grazing animals that trample roots and young growth.

In 1905 the Forest Service was established to manage forests and carry on research. The work of forest supervisors and rangers is described. Forty-three states have established forestry departments patterned after that of the Federal Government.

The amount of deforested land in the United States has been increasing yearly. It is hoped that wasteful exploitation is near an end, but one of the greatest present-day problems is fire. Extensive systems of fire suppression and control have been developed. The Federal

and State governments cooperating under the Clark-McNary Act are yearly reforesting portions of denuded forest lands.

On a junior and senior high school level, this publication is excellent supplemental material to give the values of forests, and the steps being taken to restore and conserve them.

Proceedings of the Second Park Naturalist's Conference, United States National Park Service, Washington. November 1940. 387 p. mimeo.

Papers were presented at the Conference on the work of naturalists in National Parks. These papers and following discussions were centered on the interpretative functions of the naturalist--how to instill in the visitor a love of nature by actual contact with its manifestations, emphasizing its beauty and orderliness, its inspirational and educational values and thus engendering an appreciation of and interest in its conservation. The naturalist has the responsibility to guide, to reveal and to explain. The work of the Park naturalists includes that of junior nature programs such as field trips, informal discussions, museum study, observation, etc., carried on at Sequoia and Rocky Mountain National Parks. For adults, programs include guided camera trips at Crater Lake, game stalks at Yellowstone, water cruises at Acadia, winter sports (skiing) at Mt. Ranier, museums, exhibits, lectures, and guided trips at other Parks. Numerous other papers deal with research, libraries, collecting, publications and cooperation within the National Park Service.

The proceedings are interesting and a great variety of material is presented and discussed. The interpretative function and techniques for carrying out this work is the theme of the publication. The educational implications are stressed. It is of interest to educators and people concerned with the services provided by our National Parks. If individual papers were issued for publication the general public would benefit from some of them.

Products of American Forests, Hall, J. A. and Mosley, T. J., United States Department of Agriculture, Forest Products Labratory, Washington. August 1939. 48 p. illus.

The forest is a storehouse of wealth in the form of wood and other tree products of great variety. Forests have great usefulness in keeping the land productive and habitable. They absorb rainfall and check excessive run-off; they mitigrate destructive and drying winds; they provide habitat for birds, game and fur-bearing animals; they add beauty and interest to the home-owner and recreation seeker. Under the proper system of harvesting, the forest can render these essential services while yielding its regular contribution of products. These products are (1) wood for construction, plywood, veneer, furniture, railway ties, etc.; and as fuel; (2) wood products--pulp for paper, rayon, plastics, etc.; (3) turpentine and rosin; (4) maple sugar; (5) tannins; (6) dyestuffs; (7) nuts (pecans, walnuts, chestnuts, etc.); (8) pharmaceuticals (herbs); (9) volatile oils (oil of cedar leaf used in insecticides and liniments; oil of

hemlock and spruce needles used as perfume in greases, and in liniments); (10) fruits (haws, cherries, plums, etc.); (11) miscellaneous uses (pine needles as padding in upholstry; willow, hickory, basswood for chair bottoms and handicraft work; tallow from boyberry, etc.).

This is a very complete account of the services rendered man by forests and their products. The processes by which wood is converted into plywood, rayon, plastics, paper, etc. are described in detail. A knowledge of wood composition and chemistry would be necessary for understanding these. The bulletin could best be used by high school students to learn the wide variety of forest products.

Proposed John Muir--Kings Canyon National Park, Emergency Conservation Committee, New York City. January 1939. Pub. No. 74. 20 p. illus.

The proposed bill to come before Congress renews the long effort to make Kings River Canyon a national park, and proposes to bring Redwood Mountain and Redwood Canyon into the National Park System. Redwood Mountain is rated as the largest stand of giant sequoias in existence. The owners do not want the trees cut, but the area is menaced by sale for defaulted taxes. Kings Canyon already belongs to the people, and can be included in a national park without purchase. The problem is to keep it a wilderness.

Big electric utilities believed they could develop an abundance of cheap electricity on Kings River, and opposed a national park. Experience taught power companies that rivers with a low summer flow were expensive, so their

entries were dropped. A few farmers graze cattle in the meadows, so are opposed to a national park. Sportsmen object to turning this high country into a game sanctuary. Summer home owners object to the project. The regional office of the Forest Service opposes this project too.

It is interesting to note the forces at work in the promulgation of conservation projects. This article gives a general view of the problem of this proposed national park, and the various factors involving such procedure. This article would be of interest to conservationists, and the public in general.

Redwoods--Ever-living Memorials, Grant, J. D. Save-the Redwoods League, University of California, Berkley. 1929. 7 p. illus.

After World War 1, the idea of appropriateness of trees as memorials to soldiers who had given their lives became popular in all countries which had engaged in the war. One such memorial was dedicated in 1921 to the memory of Col. R. C. Bolling. It is a block of Redwood forest on the Eel River in California. Other memorials have been acquired under a plan inaugurated by the Save-the-Redwood League. It is the plan of this League to develop the memorial grove idea as a means, not only of sentiment and respect, but of preserving an increasing number of beauty spots among the Northern Redwoods.

Trees as memorials have much to recommend them, and surely there are few men who would not be happy in thinking that their memory was to be kept green by a tree. The double purposes of preserving our forests, particularly

the Redwood which must soon disappear at the hands of lumbermen, and of sentiment are carried out in such a plan.

The publication is of interest to show what groups are doing to preserve our forests.

Redwoods of the Past, Chaney, Ralph, W. Save-the-Redwoods League, University of California, Berkeley. Undated. 7 p. illus.

Fossil evidences show that the redwood, now confined to a restricted area on the California-Oregon coast, was once prevalent in the Northern Hemisphere. Due to changing conditions of the earth--the building of mountain ranges, the rise of the continents to a higher level above the sea, and alterations in its climate the causes of which are incompletely understood--the range of the redwood has gradually been limited until the coast series is found only in California and Southern Oregon, while the Sierra species is confined to scattered groves in the Sierra Nevada.

This bulletin would be of interest to junior and senior high students in an understanding of the changes which have taken place on the earth, and the resulting influences on the life of this earth.

Reforesting, Pettis, C. R., New York Department of Conservation, Albany. Bulletin 2. 1936. 30 p. illus.

Tree planting pays. It pays the farmer, the landowner, the community, the sportsman, the municipality, the State and the nation. These benefits are in various

ways--lumber products, recreation areas, cover for game, protects lands from erosion and flood. We are so accustomed to rely on nature to provide timber and forest products, it is hard to realize that trees must be planted.

The Conservation Department has developed tree nurseries to supply small trees at a nominal cost. Directions for selection of trees based upon soil factors and uses to be made of the trees are given. The uses of pine, spruce, balsam, and cedar and conditions necessary for successful growth are given. Likewise, planting, care, yield, etc. is given.

This bulletin should be of use to any farmer, landowner, or other persons who are contemplating planting of seedlings.

Sanctuary and Nature Trail Survey, The Garden Club of America, Conservation Committee, New York City. 1939. 31 p.

This Survey was started with two objectives in view; to find out how many actual Sanctuaries and Nature Trails there were in the states where the Garden Club of America exists and how much of the work of establishing them had been done by Club members; and to learn whether Club members were conscious of potential Sanctuary areas in their neighborhoods.

The Survey found sanctuaries and nature trails where the Club had contributed funds in 28 states, of which 12 were established by Garden Clubs, 6 owned by Garden Clubs, 9 wholly supported by Garden Clubs, 8 partially supported by Garden Clubs. A total of 127 Sanctuaries and Nature

Trails were visited, 35 of which were projects of the Garden Clubs. For each Sanctuary or Nature Trail a brief description of size, operation, maintenance, and conservation progress is given.

This Survey stresses the importance of proper protective measures for Sanctuaries.

Potential Sanctuaries were found to be numerous, and these reports were filed for future use.

This Survey would be of primary interest to Garden Club members, but it is heartening to know that civic organizations are aware of the needs of such conservation practices, and are participating wherever and whenever possible.

Saving the Redwoods, Save-the-Redwoods League, University of California, Berkeley.

The Save-the-Redwoods League issues from time to time a bulletin of 7 to 12 pages, illustrated, in which are told the accomplishments to date, and the future plans of the League. Some of the major accomplishments over a period of 10 years have been (1) raising funds to contribute toward the purchase of Redwood areas (in cooperation with State funds), (2) conducting surveys, (3) establishment of memorial groves, (4) helping in removal of fire hazards, (5) advising with State Commission of Parks in regard to building highways through Redwood Forests.

Such publications give ideas as to the ways in which interested groups can aid and supplement government projects for preserving some of our natural resources.

Suggestions for Integrating Forestry in the Modern Curriculum, United States Department of Agriculture, Forest Service, Washington. 1940. 3 p.

This outline suggests the ways in which forestry may be integrated in the curriculum. On the elementary level, emphasis is placed on the home, school, and community as it is influenced by forests and trees. On junior high school level the emphasis is on adaptation of the individual to his environment and stresses forest improvement. At the senior high level emphasis is on understanding and improving group relationships and trends in modern society. Stressed is the influence of forests on living conditions, employment, control of ownership, problems of reforesting, conserving and utilization of forest resources.

For teachers wishing to teach forestry conservation with units and courses commonly taught, this outline gives many ideas on subject matter. No suggestions as to approach, or activities are given, but as content material it should be helpful.

Taming Our Forests, Buere, Martha B. United States Department of Agriculture, Washington. August 1939. 87 p. illus.

Although one third of our land is forest land we are not getting as much wood from it as we are using. We are importing wood from other countries. Trees cannot serve us if most of their effort is spent in a struggle with each other for light, water, and soil. Wild forests cover nearly 10,000,000 acres and give us pleasure and information. But

we cannot depend on them to give us what we need in lumber. Only from the forests which we can tame can we expect a continuous supply that will help us to build a secure and increasing prosperity. It takes a trained forester to break in a wild forest to the service of man. He must realize that forests are for the service of human beings; he must know what trees will supply special demands; he must know about soil, water, seedlings, and numerous other aspects. Some wild forests and cut-over lands can be reforested. Other lands must be replanted. The work done by the Forest Service is described. Harvesting, too, is an important part of the work. Enemies to be combatted are fire, disease, and insects. Detailed descriptions of protecting forests are given.

This bulletin tells how man handles the forest to keep it productive. In order to meet the needs of the nation, our forests need to be managed by trained experts. This bulletin (on junior or senior high level) would be most useful for a general study of forestry or in relation to geography, science or vocational guidance.

The Conservation of Trees and Forests (Conservation Week in the Schools of New Jersey. 1938) New Jersey State Conservation Committee, Trenton. 15 p. illus.

About 43% of the total area of New Jersey is forest land. In North Jersey, the trees are mostly deciduous. South Jersey's woods are mostly coniferous. The parts of trees and interesting life story is told. Uses of trees as source of lumber, to prevent erosion, to insure regularity of stream flow, as home for wildlife, and as

recreational and aesthetic values, are discussed. Enemies of trees are insects, fungi, and fire. Efforts to reforest New Jersey made on the part of the Department of Conservation, the work of the CCC, state nurseries and other aspects of reforestation are taken up.

Much use is made of field study in knowing and appreciating trees. The material is general in scope, but each teacher may select the portion best suited to her needs. The bibliography is excellent.

The Living Wilderness, published by The Wilderness Society, Washington, D. C. 15 p. illus.

The Living Wilderness is a publication devoted to wildlife and wilderness areas--their preservation and timely comments on the subject. The wilderness is considered a valuable natural resource, and should be protected from the influences of civilization, as highways and other developments which clash with the primeval environment. The articles are interesting and non-technical: for adult readers.

The National Park System, United States Department of Interior, National Park Service, Washington. January 1938. 12 p.

With motor travel constantly increasing, the National Park Service has expanded to meet the desires and needs of the thousands of visitors each year. Conservation in the parks was aided by the CCC. Education of the visitors is an interesting and important phase of park development. Trailside museums, information by rangers and park-naturalists

and other educational facilities have been developed. Rerecreational and living accomodations have also been developed.

Each of the national forests, battlefield sites, cemeteries, memorials, etc. are described as to what to see and do in these public-owned and administered areas.

As a source of information for tourists, for children in their school work, and general knowledge, this publication is interesting and accurate.

The Olympic Forests for a National Park, Brant, Irving Emergency Conservation Committee, New York City. Pub. No. 68. January 1938. 20 p. illus.

On the Olympic Peninsula of the state of Washington, the people of the United States own the largest great forest wilderness still standing in their country. These forests and, in summer, the mountain meadows and tundras, are the home of the Roosevelt Elk. Three times attempts have been made to set aside the area for everlasting preservation. So far these have failed. Lumber interests and the United States Forest Service have led the opposition. The President favors an adequate park and that parts might be selectively "logged." This logging is opposed because it would involve a change in national park policy which is of vital importance; furthermore the forests are so dense and the mature trees so enormous, the felling of one tree damages dozens of others. The opposition of the Forest Service is based on hostility toward the Park Service, and a gradual development of a commercial attitude toward the national forests.

This publication is issued to inform the public of

the situation, and urge them to express themselves on the subject to the President and the Secretary of the Interior.

It is interesting to note the varying interests at work for and against conservation programs.

The Story Told by a Fallen Redwood, Fritz, Emanuel Save-the-Redwoods League, University of California, Berkeley. Undated. 7 p. illus.

On March 13, 1933, this giant redwood fell, in Humbolt Redwoods State Park, Calif. Its 1200 years is a story unique in the annals of science. Facts about this fallen tree--average diameter 12.1 ft.; height 310-320 ft.; age at stump section 1204 years; gross volume 95,000 board feet; probable weight 500 tons.

Historical facts--728 A.D. the stump started; 1066 Norman Conquest; 1215 Magna Charta; 1492 Discovery of America; 1776 Declaration of Independence; 1861 Cival War; 1914 World War 1; 1932 the outer and last growth ring formed.

The life story told by the cross section shows rapid growth, slow growth, many fire scars. The root system indicated many floods and subsequent building up or raising of ground level.

This very interesting leaflet serves to interpret the significance of the Redwoods and to increase appreciation of these remarkable trees. It might well be used with upper grade elementary pubils to stimulate interest and appreciation. The diagrams are clearly

understood.

The Tasks Ahead of the Save-the-Redwoods League, Merriam, J. C. Save-the-Redwoods League, University of California, Berkeley. 1934. 7 p. illus.

The League, organized to preserve the oldest trees in the world, is concerned with five major items--(1) complete scientific study of the redwood, (2) need for intensive examination of the economic side of the redwood program, (3) recreational values of redwood regions, (4) educational program covering scientific value, economic application and appreciation of aesthetic values, (5) aesthetic and inspirational values.

The League has been instrumental in preserving as State Parks, over 30,000 acres of the native redwood fringe of forest along the Pacific Coast. It has supported all efforts of the National Forest Service to secure areas as would make possible continuing scientific and economic study of all phases of the redwood forest.

This League is one of the groups interested in conservation of our natural resources, particularly the redwood trees. The program it has set up, its objectives, and accomplishments give an idea as to what needs to be done, and what can be done. Of interest to similar groups, the bulletin might be helpful.

The Woody Plants of Kentucky, Garman, H. Kentucky Agricultural Experiment Station of the State University, Lexington. Bulletin No. 169. January 1913. 62 p. illus.

The woody plants of Kentucky are a very miscellaneous

assemblage of species which appear to have been brought together by a diversity of influences. Probably the mountains in the eastern part of the state furnished most of them having constituted a sort of reservoir which overflowed as the land to the westward became habitable. The intermediate position of the State results in the presence of a surprising variety of species. Side by side in the mountains one finds northern white pine and southern magnolias. Added to these is a host of individuals respresenting most of the trees and shrubs of the eastern United States. Conditions influencing the distribution and assembling of our trees were moisture, temperature, and means of dispersal rather than soil influences. However, the chestnut is the one tree that shows in a marked way the influence of soil on its distribution. A description and distribution by counties for the various plant families is given.

This bulletin is a result of years of collecting and observation, and is nearly complete. It might be useful in a study of Kentucky Forests on a high school level.

The Work of the United States Forest Service, United States Department of Agriculture, Washington. Misc. Pub. No. 290. January 1938. 40 p. illus.

During the 15 years beginning with 1890, the trend toward public forestry moved swiftly, culminating in 1905 with the creation of the United States Forest Service in the Department of Agriculture. Forestry, as applied by the Forest Service is concerned with the perpetuation and development of forests that they may continue their many

benefits to mankind. The National Forests are for the most part located in the mountainous regions of the country. Preservation of tree growth is of great importance in preventing or retarding soil erosion and in conserving the water for use of mankind. The policy under which the national forests are administered by the Forest Service is wise use. Before any program of timber sales in any national forest, forest officers make a careful survey and prepare a plan of management. Range administration involves the protection, development and management of the forage resource. Wildlife is considered by the Forest Service as a resource to be managed for permanent protection and use. Various improvements in the forests include fire lookout stations, ranger stations, telephone lines, roads, trails, bridges and other work. The Forest Service maintains nurseries for reforesting vast areas devastated by fire or heavy logging. Fire is an ever-present danger in the national forests. The Forest Service lays tremendous stress upon forest fire prevention. In its control work against tree diseases and insects the Forest Service is aided by the Division of Forest Pathology and other agencies. Of basic importance is forest and range research carried on by regional forest and range experiment stations. The Forest Service also cooperates with State and private forest-land owners toward better management of American forests as a whole. The Forest Service places at the service of the public its fund of information about forestry, photographs, slides, maps, filmstrips and movies.

The many aspects of the Forest Service are presented

in this bulletin. On a junior high school level, it might be used in a study of forestry or in vocational guidance.

Useful Trees of the United States, Department of Agriculture, Forest Service, Washington. Undated. 52 p. illus.

This series of leaflets describes the history, habitat, wood, foliage, flowers, seeds and commercial value of important trees of American forests. A distribution map for each species is given. The species covered are Alpine fir, Baldcypress, Eastern hemlock, Longleaf pine, Northern white pine, Red gum, Sugar maple, Sugar pine, Western white pine, White oak, and yellow poplar.

This series could be used on a sixth grade or junior high school level in a study of forests, uses of wood, or in connection with geography.

What Forests Give, Bruere, Martha B. United States Department of Agriculture, Forest Service, Washington. January 1940. 79 p. illus.

A forest is a community of plants and animals, of which trees are the most important members. In the days of the pioneer the forest furnished wood for heating and cooking and building; squirrels, turkeys, deer, maple syrup for food; and fox or wolf for skins. Today, although we have only 630,000,000 acres of forest lands left, we want from forests things of which our great-grandfathers never dreamed. We use forest products for plywood, pulp, tanning leather; we get sugar from the maple; use rosin and turpentine and other uses. Forests

hold the soil in place, and help hold back the wind thus influencing erosion. Forests can help prevent floods by absorbing rains, melting ice and snow. Trees act as windbreaks and soil holders, especially in the Prairie-Plains area. Forests are labratories for experiment stations, museums, and out-of-door classrooms for scientific study. Besides goods, services, and knowledges, our forests give us great recreational facilities. What more forests can give us in the future depends on ourselves--the care and use we make of them.

This publication is intended to show us the great source of wealth we have in this natural resource--our forests--and it does just that. Interestingly and simply written, it describes the methods of making plywood, "pulping," and of "stilling" oleoresin into naval stores. Parts could be read by sixth graders, and all could be read by junior high school students. It would be of value to groups studying conservation of trees, or in relation to geography and science.

What is a Nature Sanctuary? Agersborg, H. P. K. American Forests. August 1927. pp 398-400;415. illus.

A Nature Sanctuary is a place set aside and allowed to remain unspoiled by man. All the people may indirectly benefit from a Nature Sanctuary.

Only in a Nature Sanctuary will it be possible to perpetuate the native flora of the region indefinitely. Such an area is a self sustaining entity of unusually high economic value. In our National Forests, where grazing is allowed, it is of eminent importance. How-

ever, where grazing by domestic cattle is allowed, actual or real Nature Sanctuaries are impractical if not impossible; in most States of the Union, only quasi-Nature Sanctuaries are possible. As a permanent habitation for indigenous resident fauna, the Nature Sanctuary must be large enough to support a certain number of animals throughout the entire year. Unfenced, large sanctuaries, with a friendly buffer terrain, may be selfmanaged provided the proper food chains exist between herbivore and carnivore. In a natural state a Nature Sanctuary has a surplus of food and cover plants. To maintain it as such, the control must be either natural or artificial, or both. Artifically controlled, it is no longer a real Nature Sanctuary.

Most of us are under the impression that the National Parks and Forests are real Nature Sanctuaries. Such is not the case, and this article explains why they are not.

For the adult reader, this is interesting and informative material.

WATER RESOURCES

An Outline of the Water Facilities Program, United States Department of Agriculture, Soil Conservation Service, Washington. 1940. 22 p. illus.

Briefly given is the Government's program for building, supervising, demonstrating and direct lending for water facilities. The program provides facilities for storage or utilization of water for farm gardens, crops, hay lands, ranges, pastures, stock and other agricultural purposes in the form of ponds, reservoirs, wells, dams, pumps, springs, etc. It applies (in arid and semiarid areas of Western States) to farmers and ranchers who agree to (1) furnish acceptable amounts of labor and material, and (2) practice sound management which will provide soil and water conservation. Installation may be handled by the Department of Agriculture or farmers with the assistance of the Department. Top expenditure for any single project is $50,000.00; the average is about $2,000.00. Repayment of the loan is at three percent interest; no loan for more than twenty years. Tenants may use one of three plans outlined.

This phamplet would be of interest to farmers within the area to benefit--namely Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming.

Conservation of Water, (Conservation Week in Schools of New Jersey, 1936); New Jersey State Conservation Committee, Trenton. 15 p. illus.

The theme for observance in the schools during Conservation Week, 1936, was water. The importance of water as direct composition of all living things, and dependence of all living things upon water is stressed. Problems in conservation of water in New Jersey are related to its dense population. Water supplies to cities and towns, problems of sanitation, pollution, and health are discussed. Wildlife and water--food supply, drainage, etc. are dealt with. The influence of water on erosion and control measures such as cover crops, contour plowing, crop rotation, and so on are described. The work of the forest in relation to retarding erosion, run-off, and floods is included in this study.

This material, for teacher use, is designed to cover one week's work. However, there would be only a bare beginning in such a time span, and I think it could be carried on for several weeks. Maps, excursions, experiments, etc. are included in the activities. The work is very general, yet each teacher could localize it to her own needs. The bibliography is helpful.

Pollution--Too Bad to be True, Englis, Blye; American Forests. September 1937. pp. 442-443; 452; 463 illus.

Public Enemy No. 1 is not an individual but a network of polluted rivers that menaces the nation. Because of its effect on our health, our recreation and our finances, no other national hazard is more intimately interwoven with daily living. Industrial plants and cities dump tons of raw sewage into rivers; oil from ships ruins beaches. Wildlife (fishes, shell fish, water plants, etc.) is destroyed and the health of our people is greatly endangered. The remedy is

proper sewage treatment and treatment plants installed by cities and by industries. The Federal Government alone should be responsible, for when one state in a river basin refuses to cooperate it nullifies the entire watershed program.

This article is concerned with the effects of pollution on human health and recreation. The influence of monied interests defeats the program of sanitation; the public should be aroused and should act.

This article expresses very clearly some of the effects of pollution. Surely every interested citizen should read and heed it.

Regional Planning Part 5--Red River of the North, National Resources Planning Committee, Washington. August 1937. 80 p. illus.

The Red River of the North drains the states of Minn., N. Dak., and S. Dak. The problem of this area is water--floods, droughts, subsurface level, and pollution. The three states, with Federal assistance, have had surveys made and have a substantial start in actual construction. An interstate compact creating an agency to administer the plans has been established. The major water problem is the conservation of run-off in lakes and reservoirs and its release to stream channels at a rate which will provide a dependable supply at the time needed. The physical characteristics and climatology are described. Trends in precipitation are definitely downward. Rural population has reached at least a temporary maximum. The area is industralized to a limited extent. There are fine wildlife and recreational opportunities. The area has no irrigation;

rainfall is light in the northern and western portion; conservation of precipitation is important. Urban requirements are of minor importance. Hydroelectric power development does not enter as an item of major importance. The principal water requirements for the basin are: (1) storage in natural lakes and reservoirs; regulated release of surface water to produce stream flow necessary for water supply and dilution of waste; (2) development of certain low-water stream channels; (3) correction of flood-flow conditions; (4) restoration and stabilization of water areas for recreation and wildlife; (5) rehabilitation of drainage works of certain fertile lands, and lands uneconomically drained; (6) construction of small dams on normally dry streams; (7) study of warrantability of additional hydroelectric power production. Various storage projects, channel improvements, sewage treatment, etc. are listed and described.

This study is a plan of attack on interstate problems with Federal assistance. The water problem is one of importance to this area, and involves much planning. The material is for Congressional information, but contains much for students interested in geology, agriculture, and engineering projects.

Regional Planning--Part 6--The Upper Rio Grande Basin, National Resources Committee, Washington. February 1938. 566 p. illus.

This investigation is concerned with the water problems of the Rio Grande drainage area which lies above Fort Quitman, Texas. Valley lands of the Upper Basin are devoted to agriculture almost entirely. Because of scant

precipitation irrigation is required. The prime purpose of the joint investigation was to determine the basic facts needed in arriving at an accord among the States of Colorado, New Mexico and Texas on an equitable allocation and use of the Rio Grande in the future development of the upper basin. The provision of storage capacity sufficient to regulate stream flow for adequate irrigation was the major problem. The use of water for irrigation constitutes practically its entire use. Proposed developments include reservoirs in Colorado and New Mexico. Two noteworthy sources of additional water are (1) importation from another drainage basin (San Juan) and (2) salvage of present wastes within the basin (consumption by native vegetation). Topography, geology, distribution, and rock texture significantly affect the water supply. Consumptive uses of water studies were made, and areas in agricultural crops and water-consuming native vegetation were mapped and tabulated. The San Luis Valley, the Middle Valley and the Lower Valley are described as to types of farms, climate, irrigation methods and other factors. By technical, detailed analyses it was found that as the Rio Grande flows southward its water becomes progressively more saline, a condition that affects the soil and plant growth. Studies were made as to the possibilities of importing and storing water from other basins in New Mexico and Colorado.

This report is a factual base upon which a plan for the future development of the water resources of the Upper Rio Grande Basin may be constructed. The physical, legal, economic, and social conditions and relationships involved are numerous since this river is international as well as

interstate in character. Much of the report is highly technical, and its use by the average reader is limited. As a guide for the preparation of water plans in other interstate drainage basins in the United States, it is excellent. Maps and technical drawings supplement the material.

Stream Improvement, Massachusetts Department of Conservation, Division of Fisheries and Game, Boston. April 1935. 5 p. mimeo. illus.

Many streams in Massachusetts have good conditions during the high water of spring, but no shelter to harbor trout in the low water of summer. On such streams, improvement dams must be limited in number because of the shallow flowage they would create over the bordering flat ground. Improvement most suited to this type of stream is to make holes, creating them by a method that will place them well below the stream bed which would give them a high value as refuges in a period of low water from drouth. The safest shelter hole can be made by using dynamite to blow a hole in the bed of the stream, under a bank where a tree or interlacing will hold the bank, or under a shelving boulder or ledge.

Diagrams and drawings show stone, log or plank deflectors or barriers which protect such holes from drift or sediment.

This phamplet would be of use where conditions were such as those described in Massachusetts.

Ten Billion Little Dams, United States Department of Agriculture, Soil Conservation Service, Washington. 1939. 17

p. illus.

Wise land use is an adaptation of nature's conservation and flood-control methods to the conditions of advanced cultivation. The principles are to make water walk or creep, to store a greater part in the soil; to do this by making the soil and its crops provide, as impediments to run-off, millions of natural dams. Some of these reinforcements are: (1) Grass--anchors soil against erosion. (2) Trees--stay the flow of running water and hold soil in place. (3) Strip--cropping. (4) Furrows--around the slope. (5) Terraces--cropland dams across the face of cultivated fields. (6) Dams--a natural depression turned to form a pond or reservoir for building up both surface and underground water supplies.

The work of conserving soil and moisture forms the heart of the Soil Conservation Service program.

This booklet, written on fifth or sixth grade level, could be used in a study of the ways in which farmers may use every drop of water.

The Future is Ours, Franklin, Jay; Modern Age Books, Inc. New York. 1939. 208 p.

This book demonstrates the importance of the TVA for the future of America. Going back to our reckless and ignorant abuse of the natural resources of the Great Mississippi Valley (cutting of forests on water sheds, grazing of cattle and sheep, plowing up great areas of prairie grass and sod), and the resulting floods, dust storms, and droughts, Mr. Franklin shows how these affect the whole nation, and not only the immediate section where such devastation occurs.

The great waste and loss to human welfare, health, and happiness is stressed.

Historically, Tennessee has been the strategic key to the United States, and the Tennessee Valley was the logical place to make a start at the national control of the Mississippi Valley. This river drained part of seven states; the Valley through which it flows has heavy rainfall; the heavy forest growth on hillsides has been cleared away; the land has been over cropped; the region holds a treasure of limestone and phosphates; the people were dwindling in physical and intellectual vitality. This project is a challenge to America.

The operations of TVA--problems of ownership, leadership and direction, ulitities companies, political upheavals, and other complexities--make an exciting story. The effect of the TVA on the residents of the Valley will be something for all of us to watch.

This survey of federal power activities as represented by the TVA is presented with keen logic and great economic and social understanding. It should be read by all adults concerned with their country's future welfare.

Water, Its Conservation and Use, Morse, Stanley W. Science Guide for Elementary Schools. Vol. 3, No. 8. March 1937. 38 p.

The main emphasis in this bulletin has been placed on the use and handling of water for consumption by humans. Sources of water, kinds, and methods for purifying by (1) aeration, (2) sedimentation, (3) filtration, (4) chemical treatment, and (5) boiling are described.

Certain sections of California have an oversupply of water and others, especially the San Joaquin Valley and southern areas, have insufficient water. Therefore, provisions must be made to store the excess rainfall of the winter and to transport it to the parts of the state where there is a deficiency. California makes use of wells in the Santa Clara Valley, reservoirs for storing water used in San Francisco, both ground and surface water in Los Angeles, and the Colorado River Aqueduct supplies water to a group of thirteen towns.

Aside from human needs and irrigation, other uses of water discussed are (1) as a solvent, (2) in chemical changes, (3) as a source of hydrogen and oxygen gases, (4) as a moderator of climate, (5) changes in state (solid, liquid, gas) in relation to heating and cooling plants (furnaces, steam, refrigeration), (6) convection currents (also in connection with heating and ventilating).

This is an excellent bulletin for teachers to illustrate and supplement material used in the classroom. Each teacher can select the material she can use and adapt it to any grade level. Water as a demonstration medium has been stressed and the experiments require little apparatus. They can be carried out regardless of the teacher's scientific training. This should be a most helpful guide to any teacher concerned with water conservation and uses.

Waterways in Fall, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol. 32, No. 2. November 1938. 32 p. illus.

This leaflet describes how to make an aquarium, and how

to care for it. Life-history charts are given for the more common water plants and water animals and fish.

If the school were equipped with microscopes, these water animals would furnish a most interesting study. The directions and care of the aquarium are excellent.

Waterways in Spring, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol. 33, No. 4. March 1940. 32 p. illus.

Practices of draining everywhere that water collected in pools contributed definitely to hardships from drought experienced in recent years. Ponds, wisely managed, serve as reservoirs to maintain an underground water supply, or drinking water for stock; or breeding grounds for bait minnows, waterfowl, fur bearers or aquatic plants. Springs and streams are important on a farm. The sides should be checked by growth of shrubs and vegetation; riffles and pools on streams make for better fishing; pollution and enemy fish should be watched. Bogs and marshes can be profitable--as cranberry bogs, production of peat moss, shelter for wildlife, fur bearers. Quiet waters yield income through lease of fishing rights, fish useful as bait, food, sport (rental of boats). Another important source of income is the water mammal--mink, otter, muskrat, beaver, and others. Establishment of breeding areas, food, and protection against natural and unnatural enemies will increase the number of waterbirds. Hunting privileges would then be a source of income. Profit derived from frogs, salamanders, or snakes would be negligible.

This leaflet describes what may be done to improve wet

places on the farm. It would have some value for schools, but the general plan is to help farmers and landowners improve their farms--the ponds, springs, streams, etc. The graphs used would be difficult to use below junior high school level.

WILDLIFE RESOURCES

A Gallant Fish Passes, East, Ben. American Forests. July 1937. pp. 334-335; 367-368. illus.

The Michigan grayling is gone forever from the earth, or so nearly so that all hope of preserving him may as well be abandoned. Once he was abundant. Michigan did not watch him pass without a struggle. As far back as 1878 the efforts of the State included it in its fish propagation program. In 1902, 1924, 1925, 1931 and 1936 efforts were made to obtain breeding stock, but in 1935 no fish at all were obtained.

What caused the rapid disappearance and final extinction of this isolated member of the grayling family, no one can say with certainty. Various theories have been advanced and it seems probable that several of them have a major bearing. Most commonly accepted is the contention that the cutting of Michigan's vast pine forests resulted in changed conditions under which this delicate game fish could no longer exist. Another belief frequently advanced is that the driving of millions of feet of logs down the rivers destroyed the spawning beds of the grayling; cedar logs may have fouled the beds of the grayling with acids. Finally, many anglers hold the opinion that the rapid spread of the eastern brook trout was fatal to the grayling.

This article brings to mind the passing of the passenger pigeon, the heath hen, and the great auk. It is solemn warning of what may happen to other species

if we do not act in regard to our wildlife conservation. All adults, interested in the future of our conservation program, should read with keen and alarmed note.

A Grand Tour of the Major Refuges, Where the Wildlings of the Air Find Sanctuary, Zahniser, Howard; American Forests. June 1937. pp. 287-292 illus.

We Americans in the past have had strange ways with our wild birds. Depriving them of their natural habitat and depleting their numbers for sport, we have been either heedless of consequences, or else blindly trustful in some presumed Power. Fortunately, the Federal Government has at last come to the rescue and is providing the birds with thousands of acres in every section of the country. It is not only acquiring areas but developing them for use of the birds and other wildlife. The United States Department of Agriculture now administers about three million acres for wild birds. This may not be enough for an altogether adequate program of restoration, but is is a forward step toward that end. These areas (sanctuaries or refuges) afford portection from the hunter's gun, the plow, the ax, and the ditch-digger. They provide safety where wild birds can feed, breed, rest and winter. An armchair tour of these refuges shows the varied conditions and their diverse inhabitants. Briefly, the 75 refuges are described.

Written in an interesting manner, this article would be of great interest to a bird study group.

A Guide to the Fishes of Tennessee and the Mid-South, Kuhne, Eugene R.; Tennessee Department of Conservation, Division of Game and Fish, Nashville. March 1939. 124 p. illus.

The demand for a booklet describing the more common fishes in the State and immediate region has come from high school students, sportsmen, conservation officers and from educators. This bulletin gives the sportsmen a tool whereby almost any fish taken in angling may be identified; high school and college students may use it as a text in beginning ichthyology; the information is concise and accurate. The key to the families is as simple as is possible. External characters are used wherever possible. Absence of many technical terms makes the key easier to use. Each family and genus is described. The illustrations and references are excellent.

As a guide for high school students and fishermen, the publication is very good.

A School for Game Protectors, Luttringer, Leo A. Jr. American Forests. December 1936. pp. 562-563; 580 illus.

Pennsylvania has removed the last political barrier to the protection and preservation of its wildlife. By establishing a permanent training school for all field personnel engaged in the administration of its wildlife program, the State has closed the avenue open to politicians. The selection of student classes is one of continuous elimination, so

efficiently conducted that the expenditure of money, time and effort is comparatively small. The training is academic and practical. The requirements and type of training are described.

This program seems very fair, and very efficiently carried out. It should have a distinct bearing upon future wildlife conservation programs in other states which have grappled with the political problem. Conservationists and administrators should read with interest.

Are They Vermin? Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol. 31 No. 2. November 1937. 32 p. illus.

Let a skunk parade before a nature lover, a trapper, a poultry raiser, a gardner, a sportsman and a farmer. Each judges the animal on an entirely different basis. What is true of the skunk is equally true of the great number of birds and mammals which, for some reason or for none at all, are considered vermin.

This leaflet presents the factsthat have been gathered about these creatures. The birds of prey, hawks and owls, are the topics under discussion. Charts give the description, range, behavior, reaction to heat, light and moisture, man's interest for various species of owls, hawks, blue jay, crow, fox, mink, squirrels, rats, raccoon, bob cat and others usually considered vermin.

The discussion of hawks and owls is very complete

and interesting. The material could be used by upper elementary and junior high students. The value of the chart is questionable since it would necessarily need to be re-worked in a form to present to children of any age or level.

Biennial Report of the Bureau of Scientific Research and Statistics, State of Louisiana, Department of Conservation, New Orleans. 1936. 102 p. illus.

This report covers the biennium 1934-1935. This Bureau has been called upon to answer inquiries from many of the leading conservation agencies throughout the country as well as various federal agencies. These reports included poisonous snakes, inquiries relating to fishes and pollution studies. In 1933 reports were received of disastrous oyster mortality in certain coastal areas adjacent to relatively recent oil developments. Field surveys and experiments were conducted. Evidence presented in the report showed that the discharge of oil into the sea produces profound changes in the nornal environment of the oyster. Such pollution may cause irreparable injury and death of the oyster. From the point of view of conservation, natural oyster resources of the sea must be protected from this danger.

A very complete and interesting report on the black widow spider--its distribution, description, egg cocoon, habitat, behavior, bite, symptoms, medical treatment and control measures--are given.

In a report on shrimp, suggestions for reallocating

the fishing intensity from the small shrimp to the large specimens may be possible to increase the catch and value of Louisiana shrimp.

The statistical summary of that state's natural resources is in the form of bar graphs and is easily understood.

This report tells of the activities of the Bureau. To those in certain business enterprises in Louisiana these reports would be of interest. Parts, especially the reports on the black widow spider and shrimp could well be used in schools by fifth or sixth grades. The statistics lend themselves to graphic presentation.

Biennial Report of the Game and Fish Commission, (for October 1933-September 1935) Mississippi Conservation Department, Jackson. 77 p. illus.

This report covers the progress and plans of the Commission for the preservation and increase, wherever possible, of the state's wildlife resources. These activities include (1) game surveys, distribution of certain fishes and other aquatic forms; (2) fish rescue from stranded pools and shallow lakes, campaign of education advocating more self-sustaining farm ponds for game fish; (3) cooperation with public relations (National Resources Board, FERA. Surveys and reclamation); (4) supplied collections of reptiles and amphibians to United States Museum; (5) propagation and scientific collections made for study; (6) press releases on open seasons and bag limits, issued monthly "Conservation News," issued other informational data; (7) submitted projects for

W.P.A. (lands to be fenced, recreational centers, rearing pens, hatcheries, etc.); (8) contacted fur trappers; (9) prepared three-reel movie of game and other wildlife, exhibits at State Fairs, Museum unit arranged for schools; (10) restocking of game birds, animals, established one game farm.

This is a rather detailed report of the plans carried out and those in progress in the game and fish commission of Mississippi. It gives a good insight to the workings of that body. Provided with more funds, the commission expects to expand their program. It might prove helpful to like agencies.

Biennial Report of the Game and Fish Commission, (October 1935-September 1937) Mississippi Conservation Department, Jackson. 25 p.

The activities of this Commission included (1) educational talks, lectures, movies for schools and civic organizations; exhibits at fairs; monthly publication "Game and Fish" issued; (2) extensive restocking of game and birds, fish rescue; (3) game refuges established; (4) publicity through newspapers and radio; (5) survey of fauna and flora of Mississippi started; (6) issued licenses for hunting and fishing and trapping; bought from trappers or hunters, all female raccoons to be released at end of trapping season.

Of interest to the State Legislature, citizens of Mississippi, and other conservationists of wildlife, this report gives the progress, plans, and policies of the State Game and Fish Commission.

Birds and Wild Animals, United States Government Printing Office, Superintendent of Documents, Washington. Price List 39 - 34th edition. July 1939. 9 p.

This list of publications, relating to the above subjects, includes all the government material on those subjects. The prices are nominal--all $1.00 or less. The topics covered are varied. Nearly all the material is on an adult level, yet teachers could find some which they might use with their classes and as reference material.

Birds of Tennessee, (in Verse and Story) Craig, John L. Educational Service, Department of Conservation, Nashville. Undated. pp. 3-75 illus.

This booklet is a reader and work book containing facts about nesting habits, naming of birds, definitions of migrants and residents. There are also verses, stories, and descriptions of thirty Tennessee birds. For each bird there is a space in which to paste a bird picture. These sets of bird cards are made available by Church and Dwight Co., makers of Arm and Hammer Soda.

The poems are cleverly written and should add to pupil interest. The accompanying stories are well written and contain many pertinent facts. The activity of pasting in the pictures will be appealing to children. The vocabulary is too difficult for lower elementary grades.

The booklet would be useful in the elementary grades (fifth or higher) as a supplementary reader.

Colleges and Universities Offering Courses in Wildlife

Management, 1937-38, United States Department of Agriculture, Wildlife Research and Management, Washington. Leaflet BS-98. October 1937. 8 p.mimeo.

In the Federal and State services and in the educational and research work of colleges and universities there is a limited demand for highly trained persons. The list of American educational institutions is segregated into groups that offer (1) a full wildlife curriculum leading to a degree; (2) a partial wildlife course in connection with forestry; (3) a partial course in connection with agriculture; (4) elective wildlife courses in connection with general zoology or biology. Institutions in the graduate field offer advanced students material organized from original sources, seminars and research problems.

This compilation of institutions assists students seeking information regarding graduate and undergraduate training in wildlife management.

Conservation for What? Davies, P. A. The Kentucky Warbler. Vol. 17, No. 1. 1941. pp. 2, 3.

Interest in conservation and restoration of wildlife has increased in the past few years, but in all the magazines, newspapers, radio and other sources of material there appears to be no uniform aims and methods for a sound conservation program. The sportsmen are the interest group now forging ahead. Their aims are clear and they have financial backing; their interests are usually selfish and onesided.

Ornithologists should and could assume a definite

leadership. They should formulate a definite program and work toward its accomplishment. The program should enter the schools as an integrated part of the subject taught; clubs and business organizations should be solicited for aid. The friendly spirit of the farmer and stockman should help to form a solid front for the protection of wildlife, if educated in the correct way.

Conservation, restoration, and wise use of our wildlife can be accomplished by clarifying the aims and methods of such a program. The plan needs organization and education at work with it. This article gives an overview of the situation and its possible solution.

Conservation Laws Relating to Wild Water Fowl, Birds and Game, Maryland Game Division, Annapolis. Vol.3. 1937. 71 p.

This compilation defines game, describes the various kinds of licenses needed in Maryland, the duties of gamewardens and deputies, bag limits, seasons, penalties, etc. in relation to upland and migratory game birds and game animals, song and insectivorous birds, wild water fowl, boats, duck blinds, muskrat, raccoon, opossum, elk, and deer. Also included are the regulations pertaining to state game refuges and hunting grounds.

This phamplet is published so that hunters, trappers, and the general public may know the laws of the state, and to enable them to cooperate in enforcing the conservation laws of the state of Maryland.

Cornell Rural School Leaflet, (Teacher's Number) The New York State College of Agriculture, Cornell University,

Ithaca. Vol. 33, No. 1. September 1939. 64 p. illus.

This leaflet, for the teacher, gives the various orders and species of mammals (distribution, description, food, and uses or values) commonly found in the United States and neighboring countries. The purpose of such material is to add interest to geography. The teacher could re-work the material for her children, or through the information given could collect materials on these mammals as certain sections or areas were studied.

The second part of the leaflet discusses nature study as the foundation of sex education in the home and school. Sex education attempts to help young people interpret the various relation of the human sexes. The biological "facts of life" are fundamental, but the sex education is more than biology, because mental and social relations of the sexes play so great a part in the lives of educated people. Suggestions for developing sex education through nature study are given.

This discussion may help parents and teachers answer some of the questions put to them by children. Great confusion is present in this problem. This is a good overview and one way of approaching the situation.

Doom of the Great Lakes Fisheries, Van Oosten, John American Forests. March 1937. pp. 103-105; 144 illus.

The Great Lakes and their connecting waters are the chief commercial sources of our most highly prized fresh-water species of fish. These species are facing extermination; yet little is being done to save them despite the strong national trend toward conservation. The Great

Lakes account for all of our commercial production of such species as the widely advertized whitefish, lake trout, wall-eyed pike, yellow perch, blue pike, sanger, chubs, cisco, lake herring and suckers. As soon as one fishery is wiped out, another one is threatened because the nets that had been employed in catching the exterminated species are diverted to the capture of other species. To remedy the situation, we must reduce the present fishing intensity. The greatest single handicap that confronts the adminstrators is devided control. The Great Lakes fisheries are not under the jurisdiction of the Federal Government, but are administered by the eight states fronting the Great Lakes. Unless some firm action is taken, and taken soon, the productivity of the lakes that are still supporting a fairly large fishing industry will repeat the history of production of Lake Ontario.

This article foretells the depletion of fisheries in the Great Lakes, the seriousness of which is little realized by the public. Of interest to all adult wide-awake citizens, especially those of the Great Lakes region, it informs the public of the situation.

Duck Ponds Versus Deserts, Darling, J. N. Rotarian Magazine. October 1938. 3 p. illus.

That we have poured down the rathole much of that which nature gave us on this magnificant continent is apparent at a casual glance. Our forests, of priceless value if we had them back today, have been hacked down and burned away. Our rivers, which onee teemed with fish

and aquatic life, have become sewers to carry away the waste of our civilization. Our soils, richest in all the world, have been so abused that millions of acres which once produced food and comfortable living for human beings, are now abandoned and becoming eroding wastes, scars of heedless and prodigal existence of a few brief generations. We have now come to the end of our frontiers.

On a trip covering the Mississippi Valley from the Gulf to Canadian borders, a survey was made by the author, of the duck-recovery refuges. This was just a small segment of our national conservation problem; and these projects were successful because conservationists got together and demanded it. Numerically, conservationists are thick, but not beneficial. We have lots of conservationists, but little conservation, and our resources continue to disappear. And the strangest thing about conservationists is that they don't have to do the work themselves. A full corp of men is ready, but lack the means to accomplish their normal duties. Education is badly needed. We have the potential factors necessary if sportsmen and conservationists will only organize and tell their story loudly enough.

Written in an interesting and forceful style, this article is a rousing plea to conserve for the coming generations those wildlife resources of America intended to be a heritage for all. For the layman, it is interesting worthwhile reading.

Enter Hawk-Exit Mouse, Pough, Richard H. National Association of Audubon Societies, New York City. Circular No.

24. Undated. 4 p.

In 1938 Reading, Pa. acquired a tract of about 3,500 acres as a site for an impounding dam. In the next few years seedlings of Red and Scotch Pine were planted. Today between the seedling pines, the former meadows have developed an ideal retreat for all sorts of small creatures. Various hawks and owls have found the watershed a haven of refuge and bountiful source of their favorite food supply--the common meadow mouse. About this same time the city forester brought in a number of girdled pines. This damage, upwards of 40% loss, had been done by the meadow mice. It was not hard to convince the water bureau that more hawks and owls were needed. No more shooting of birds of prey was permitted.

This is typical of many sections of our country. Meadow mice girdle fruit trees as well, are a nuisance to agriculture, and eat the same weed seeds and grain that game birds depend upon. The story of the meadow mouse and the way its presence affects other living things is a typical example of the complex interrelationships that exist in the world of nature.

This bulletin does much to aid in the understanding of the complexities of nature, and the part that all animals (particularly birds of prey) play in relation to others. Such articles do much to dispell popular false notions of farmers, sportsmen, and the general public.

Essentials for More Bobwhite Quail in Kentucky, Gilpin, James K. Kentucky Division of Game and Fish, Frankfort;

Wildlife Conservation Bulletin No. 1. Undated. 3 p.

Under normal conditions and barring unusual disturbances, about the same number of coveys will occupy the same range year after year. It is only by increasing the number of suitable areas that new coveys can be induced to establish themselves.

Requirements for the existence of quail are (1) Cover --shelter, escape, feeding and nesting. (2) Food--insects, fruits and berries, weed seeds and grains, green leaves, buds. (3) Water.

This folder will help the farmer and sportsmen to bring about better living conditions for our wildlife and give them the protection they need.

Finishing the Mammals, Edge, Rosalie; Emergency Conservation Committee, New York City. 1956. 24 p. illus. Pub. No. 59.

Scientists state that the fur trade is definitely bringing to a close the Age of Mammals. Occupation by man of more and more of the environment available for mammals is contributing heavily to their extermination. Hunting, bounty payments, "control" campaigns, and "vermin" destruction are taking toll of these mammals. The United States kills more fur-bearing animals than any other country in the world. The cruelty and waste accompanying the use of the steel-trap is deplored.

The gun and ammunition manufacturers and the trades that cater to "sport" have organized a campaign of propaganda against wild creatures. These campaigns describe how certain animals prey upon others, yet scientific

studies reveal that food habits are not of a predatory nature. The evils of bounties are described. The United States Biological Survey is soundly "rapped" for its use of steel-traps, and use of poisons.

This phamplet discusses the impending fate of medium-sized animals, those below the size of "big game," concerning the destruction of which the public is partially aware, and those above the size of mice and the like. It deals largely with fur animals, including small game, as oppressed by trappers, hunters, and game keepers. It should interest those in the fur trade, trappers, and those concerned with saving our fur-bearers.

Florida Commission of Game and Fresh Water Fish, (Biennial Report) Tallahassee. December 1936. 62 p. illus.

Florida is preeminently an outdoor State. Its climate and many natural resources plus other outdoor physical resources furnish the basis for much of the development and wealth which has made the Florida of today possible. The relation of these natural resources to Florida's future prosperity give a great importance to the Conservation of Natural Resources in this State. Florida's wildlife resources have many values--aesthetic, recreational, and economic. Florida's program for the conservation of wildlife resources has been built along three lines: protection, propagation, and education. The activities of the Commission included issuance of licenses, took game census, restocking of game (quail, wild turkeys and guineas), managed game preserves and refuges, fish hatcheries, seined lakes for rough fish;

edited "Outdoor Florida," published a folder on fishing, gave lectures before prospective teachers on conservation, assisted in exhibits, and cooperated with civic organizations and clubs.

This publication gives an insight to Florida's program of conservation. The program is based on sound principles, and, though handicapped by lack of funds, is working to promote conservation of wildlife resources within the state. This is for adult reading.

Foods of Some Predatory Fur-Bearing Animals of Michigan, Dearborn, Ned; University of Michigan, School of Forestry and Conservation, Ann Arbor. Bulletin No. 1. 1932. 52 p. illus.

The topography and flora of Michigan are suitable to accomodate a great abundance and variety of animal life. The fur resources of Michigan have declined, yet, in spite of these depletions, the state still ranks third among the states in fur production. One serious obstacle to any improvement of the present situation lies in the wide spread prejudice against many of our important fur-bearing animals because of their predatory habits. Only two of the fur-bearers--muskrat and beaver, can be called vegetarians; the other nine are largely or exclusively carnivorous. Public interest extablished the motive for assembling evidence to show the actual food habits of the animals in question: opossum, raccoon, red fox, coyote, wildcat, skunk, mink, weasel and badger. This investigation lasted two years and studies of visceral contents and feces were made. The results showed that chief food

items of the animals were (1) opossum--fruit, flesh--mostly refuse; (2) raccoon--crawfish, grain; (3) red fox--rabbits, mice, fruit; (4) coyote--rabbits; (5) wild cat--rabbits; (6) mink (summer) crawfish, mice (winter) muskrats, rabbits, mice, fish; (7) weasel--mice; (8) skunk--insects, fruit, corn, mice; (9) badger--mice, rabbits, ground squirrels. Predatory animals in general are not especially dangerous to game birds.

As to the value of the annual fur crop, there can be no doubt. The evidence is submitted in the issue between those groups which would kill off predators, to protect game birds, and those groups which prefer to conserve the smaller predatory mammals for their service in destroying pests, their fur, and their recreational value.

This bulletin substitutes facts for guesses and provides information essential for the wise management of one of Michigan's important resources.

4-H Club Guide in Wildlife Conservation, South Dakota College and South Dakota Department of Game and Fish, Pierre. 1936 40 p.

In the 4-H program, conservation is considered in its broadest sense. Soil, trees, shrubs, home beautification, birds, maintaining water levels, wildflowers, insect control, rodent control and many other things are directly related to the general conservation program. Activities carried on by 4-H Clubs may include a wildlife survey of the community and what action is desirable in the carrying out of the program, start a library of conservation books and bulletins, meet with local game warden,

stage a public exhibit, tour, picnic, ect. to familiarize public with a need for conservation, keep newspapers informed, obtain and keep pictures of interesting activities, and have summaries written of all conservation work done. This is a guide for the Club as a whole. Individual activities might include planting of trees, leaving fence rows and strips of grain for feed, build feeding stations for birds, and so on.

This guide is especially designed for use in rural areas and the opportunities are varied and plentiful for a wildlife conservation program. The program as outlined may cover several years work, , and much good could be accomplished by such a program. Surely all 4-H Club leaders should possess this publication.

Gambling With the Ducks, Emergency Conservation Committee, New York City. Pub. No. 82. February 1941. 4 p.

The only safety for the waterfowl is to insure a sufficient breeding-stock. The Fish and Wildlife Service is under constant pressure for relaxation of all regulations. The sale of duck stamps has doubled in the last five years. The regulations now in force are too lax for safety. Four measures advocated are (1) no shooting anywhere after December 15th; (2) hunters of migratory birds limited to one geographical zone; (3) no more step-by-step surrender to pressure; (4) no open season on the wood duck.

This bulletin informs the public of relaxing regulations when weather conditions favor waterfowl, and the decreasing of waterfowl.

Game, Fish, Park Laws and Regulations of Nebraska, Game, Forestation and Parks Commission, Lincoln. 1957. 56 p.

This is a compilation of laws of Nebraska as related to (1) definition of game and fish, (2) permits to hunt and fish, (3) open seasons and bag limits, (4) reserves and sanctuaries, (5) penalties and enforcements.

For any hunter or fisherman who expects to participate in the state of Nebraska, this booklet is essential.

Game Management on the Farm, United States Department of Agriculture, Washington. Farmers' Bulletin No. 1759. October 1936. 22 p. illus.

Game management makes it possible for the farmer or landowner to increase the number of game birds and mammals on his property, and by so doing to produce benefits and realize profits that will reward his efforts. Game birds are among the natural aids of the crop grower as they consume cutworms, grasshoppers, caterpillars and other destructive pests, as well as weed seeds. In addition to these benefits from the mere presence of the birds, an annual game crop can be harvested from their increase. If by planning, a property owner can combine on his land game production with crop production, and at the same time control erosion, he is only doing what any good farmer ought to do to get the best use from his acreage. The actual steps in putting a game management plan into effect must begin with a survey of the farm--crop area; non-crop areas such as fence corners, steep slopes, gullies, etc; permanent cover and food patches and temporary cover and food; seek advice of county agent, state game commission

or other agents; if no wild stock exists on the property, consult state game commission as to methods of stocking; game management need not be a complicated nor expensive practice. Cover may be any type of low, thick-growing bushes, or vines. Food may be waste grain or a small bit of crop left standing, berries of shrubs forming the shelter or grains planted purposely for the game.

The future of upland game shooting is in the hands of three agencies: the landowners, the state game commissions, and sportsmen and their ability to develop and maintain a system that will bring pronounced benefits to all. The Iowa plan is a good example.

This bulletin describes how farmers can manage their farms so that game will be more plentiful, realize cash from hunting privileges, and at the same time, prevent erosion of ditches and gullies. It is an interesting bulletin, simply written, for farmers and sportsmen.

Game Refuges and Propagation Areas Add to Indiana's Wild Life Program, Department of Conservation, Division of Fish and Game, Indianapolis. Undated. 4 p. illus.

This leaflet describes Indiana's program of propagation to insure good hunting in Indiana, and game management practices in both private and public lands. This program includes planting of grain, trees, shrubs for natural food and cover in areas where it is needed. The program also includes establishment of marsh and lake areas for migratory waterfowl. Within the game preserves are wildlife displays and recreational facilities.

The leaflet describes the multiple aims of conservation

programs--saving wildlife, recreation, and educational aspects. Other states seeking a similar program could profit by the use of the leaflet.

Game Returns to the Land of William Penn, Luttringer, Leo. A. Jr. American Forests. September 1936. 403-407 p. illus.

Today, Pennsylvania is famous for its wildlife, as well as for its laws and policies governing wildlife management. Forty years ago, when few men talked or dreamed in terms of natural resource conservation, the State awakened to a tragic realization. Its once abundant wildlife was diminishing, in some regions disappearing. In 1895 a Board of Game Commissioners was created to determine the State's policies of wildlife management and restoration. In 1897--the passage of a law prohibiting use of hounds in deer hunting; 1905--black bears were given protection; in 1907 female deer and young males were protected; 1913--the hunting license was authorized and "bounty law" passed; subsequent years saw all the game laws codified. Various Bureaus were created for acquiring land, establishing refuges, enforcing game laws, etc.

This brief discussion of Pennsylvania's gallant and successful fight for wildlife recovery is interesting and noteworthy. It shows what can be accomplished by men of vision and purpose. It should interest all adults who have the future of their state at heart.

Game to Spare, Shantz, H. L. American Forests. December

1937. pp. 574-578; 598; 608 illus.

To maintain favorable conditions for perpetuating big game in the National Forests, the United States Forest Service has made game management an integral part of forest management. It is just as necessary to regulate the number of game animals in the forests and on the ranges, as it is domestic stock on a farm, or ranch. Balancing the herds with the feed production is the plain philosophy of game management. The normal amount of hunting in easily accessible regions usually takes care of surplus game. In less accessible or strictly protected areas, those responsible for the welfare of the game, and for other uses of the land, occasionally find the areas overpopulated, particularly with deer, and in a few localities with elk.

Instances in Flathead National Park, Selway National Forest, and in Utah, are cited as evidences where winter food was insufficient and herds had to be thinned. Current fallacies are (1) wild game is fading, (2) restriction of shooting is the only important principle of game and management. More people need to study the problems of game in relation to forage.

This article does much to clear up ideas regarding big game and management. This problem is not fully comprehended by the general public. For the average reader, much information could be gained by reading it.

Good References on Conservation of Birds, Animals and Wildflowers, United States Office of Education, Government Printing Office. Washington 1938. 11 p.

This annotated bibliography is classified under the topics (1) material for children and (2) material for teachers. Grade levels are given. All material is available from the United States Government.

Since material usable with children is difficult to find this list should be of great aid in compiling material.

Governing Wildlife Development, (Massachusetts State Policies) Massachusetts Department of Conservation, Boston. February 8, 1937. 7 p. mimeo.

The purpose of establishing wildlife areas in state forests is to protect, cultivate, and increase useful wildlife as a valuable resource of the forest. This will provide a place where it can increase to the point where it will overflow to the adjacent land to produce normal breeding stock thereon and in turn enhance the surrounding territory by benefiting the farmer and providing recreation for the nature lover and sportsman.

The choice of an area tc be developed should be selected on the basis of location, roads, varied topography, water supply, flora and fauna. It should be mapped. Development should be along lines of forest fire protection, winter cover planting, food strips and patches, permanent food and escape cover, swamp improvement, stream improvement, census bi-monthly, protected against trespassing. Maintenance activities will vary; each area is a separate problem.

This plan is part of Massachusett's program for conservation of wildlife. It should be read with interest by

conservationists in other states formulating similar plans.

Happy Hunting Grounds of Tennessee, Tennessee Department of Conservation, Nashville. Undated. 28 p. illus.

This attractive booklet describes the various hunting and fishing facilities of the state. A wide variety of fish--trout, bass, bream, etc., hunting for quail, turkey, duck, rabbit, fox, wild boar all are available in Tennessee. Norris Lake, Reelfoot Lake, Cherokee National Forest, Cumberland River and various other streams are pictured and described.

Issued primarily for sportsmen, this booklet is also interesting to the tourist. Its pictures tell the possibilities of the state in all types of out-door recreation.

Homes, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca, New York. Vol. 31, No. 3. January 1938. 32 p. illus.

The types of homes--temporary to escape danger; ancestral (rather unusual in nature); apartment houses--pine cone willow gall; and their constructions as caves (woodchucks, weasels, minks, etc.) stone (caddis worm, mice, snakes, trout, etc.) masons (robins, beavers, mud-dauber wasp, cicada), wood (squirrels, woodpeckers, raccoons, etc.), weavers (birds, stickleback), and various other materials are described.

Not much home life is evident among animals, however, a few examples are given (ants, bees stickleback, spiders, etc.) and discussed in relation to building the home, sanitation, storing of food, care of the young and pro-

tection. Descriptions and suggestions are given for building and placing homes for wildlife (bird houses, cover for quail, frogs).

This leaflet is a very complete presentation of the various homes of wildlife. The key for nests of birds would be rather difficult for young children to use. The leaflet could be used by fifth graders and older children. Since little children are naturally interested in homes, the material could be reworked to their level.

How to Raise Game for Profit, Rockel, W. M. Jr. The Peters Cartridge Company, Kings Mill, Ohio. 1932. 47 p. illus.

There is an ever growing demand for game on the part of hunters to shoot, people who want beautiful game birds for pleasure, hotels and restaurants for food, sportsmen for hatching eggs and day old chicks for raising purposes. This demand cannot be met now, but with such a potential market, and good profit, many are becoming interested in raising game. This booklet describes raising pens, setting and hatching, care of young chicks, shipping of eggs and day old chicks. It also gives an idea of how a farmer can increase his income by (1) providing food and cover on his farm, and increasing the game on his farm and (2) selling or leasing his farm for hunting privileges to individuals or sportsmen's organizations.

This booklet puts the raising of game on a commercial basis. It should interest those who like that sort of thing, and farmers who would like to increase their income. From a conservation viewpoint, little or nothing is gained from such a publication.

Identification Key to the Reptiles Native to New Jersey, Scovell, E. L. New Jersey State College of Agriculture and Agricultural Experiment Station, Rutgers University, New Brunswick, New Jersey. July 1937. 15 p. mimeo.

Safety first rules are given for the person who is in a region where poisonous snakes may live. The copperhead, rattlesnake, water moccasin, and snapping turtle are exceedingly dangerous, and the wise person should take no chances. First aid treatment in case of snake-bite is given.

The key, designed for use of 4-H Clubs, is very simple. Little attention is paid to scientific classifications and terminology. The membership of classes, family groups, etc. are rather scattered. Once the name of the specimen is known, it is relatively simple to consult books for information on classification.

Because of its simple terms, this key is usable by the average adult or upper elementary student.

Improving the Farm Environment for Wildlife, United States Department of Agriculture, Washington. Farmers' Bulletin No. 1719. January 1934. 61 p. illus.

Farm practice can often be modified so as to benefit wild things and yet in no way interfere with agricultural objectives. Cover for wild life is of essential importance. Concealing cover should be thick enough to afford some degree of concealment, though it should not be so thick as to keep game from maneuvering easily. Shelter cover and nesting cover are likewise of importance. Uniform cover conditions tend to limit the number of species, or the

number of individuals, whereas diversified cover increases the number. In addition to being diversified, cover should be distributed--but not too widely. Distribution is particularly important as regards its location in relation to food. Farm wood lots are valuable in producing fuel, lumber, conserving moisture, checking erosion, and as game production areas, for they contain most types of game coverts. The greater the variety of trees, shrubs, and vines, the greater is the value of the wood lot as a home for wildlife. Orchards, roadsides, marsh and water areas, and marginal lands may be planted and developed as covers for wildlife. Food supply must be a year-long chain. Summer is usually a season of plenty; fall and winter feeding is necessary. Planting of shrubs, nut trees, leaving strips of grain, shocks of corn, and other areas are ways of increasing the natural food supply. Wildlife should be protected by the farmer in his operation of machinery (harvesting and mowing machines); reduction of the number of owls and hawks may be feasible; management is necessary to control infections and parasitic diseases. Possible returns from game management (aside from esthetic) may be realized by rentals, leasing, or other exchange of services between sportsmen and farmers.

This bulletin discusses how the farmer may encourage desirable wild creatures upon his lands, game species in particular, and how returns can compensate him for altering his premises and policies. Wildlife management has been referred to primarily as a game production undertaking, with purposes more or less specific and even

mercenary. For the farmer who desires game as a "cash crop" this bulletin should be helpful.

Indiana Lakes and Streams Stocked With Fish from State Hatcheries, Department of Conservation, Division of Fish and Game, Indianapolis. Undated. 4 p. illus.

Briefly, this leaflet tells of the state's program for propagating fish. Indiana has 16 state hatcheries. Pictures show various activities carried out in hatcheries and at lakes and streams. Displays and recreational opportunities at the hatcheries draw interested sportsmen and offer educational possibilities.

Of interest to sportsmen within the area, and to nature study groups or schools, the leaflet offers suggested visits for pleasure and study.

Insects of Nebraska, Nebraska Game, Forestation and Parks Commission, Lincoln. Conservation Bulletin No. 5. Undated. 4 p.

Insects furnish material for one of the most fascinating branches of nature study. Grasshoppers, chinch bugs, codling moths, and others must be destroyed, but ruthless destruction of millions of useful insects has been responsible for millions of dollars loss.

A table presents the harmful and beneficial insects.

This bulletin would be of special interest to farm boys and girls for they have great opportunity to study these insects and have great interest in their action and work.

International Committee for Bird Preservation, (4th Bulletin)

National Association of Audubon Societies, New York City. 1935. 62 p.

This Committee first met in 1922, for the purpose of devising plans for advancing the cause of wild bird preservation throughout the world. Subsequent meetings saw the addition of delegates from more and more foreign countries. In 1935 it was composed of members from 26 countries. Representatives told what had been accomplished by their countries. In the United States the report was concerned with the decrease in waterfowl as a result of drainage and drought, and plans for establishing water areas for ducks. Considerable progress had been made in Belgium for protection of game birds; Canada had done a good deal of educational work by issuing ornithological text books, lectures, newspaper releases and phamplets; in Gentral Germany a program for repopulating forests with hole-nesting birds was under way; in France, the only efficacious way of preservation for birds and game is the predominance of private properties; Italy had passed laws restricting hunting seasons; bird protection in the Netherlands was very active; Poland had given legal measures and had carried out an educational program within the schools; in the Union of South Africa much conflict of interests was in force, and little had been accomplished.

These reports seem that gains in bird protection is rather discouraging, yet we must realize how far mankind has had to travel before acquiring even the interest that is today manifested in bird preservation. The exchanging

of ideas and experiences makes for a closer association between people who have the same objects in view.

This report should interest ornithological groups of our country.

International Committee for Bird Preservation, Pearson, T. Gilbert; International Committee for Bird Preservation, New York City. May 1938. 5 p.

This address was given at Rouen, France, by the American representative to the Committee. Few countries south of the United States give any particular attention to the protection of wildlife, and a few have no laws on the subject whatever. In efforts to contact people in Latin American countries who might be interested in giving information regarding bird protection or who would lend cooperation in bettering the situation, it was found there were very few scientific or organized sportsmen's groups. Sections of the International Committee have thus far organized in five countries of the Western Hemisphere--namely Canada, Argentina, Mexico, United States and one other (not mentioned)which has not been active. In the United States restoration activities in connection with mosquito control, pollution of waters by oil, establishing game bird breeding farms, increase of wildfowl supply, and law enforcement measures are discussed briefly.

This report briefly summarizes the activities of the United States in connection with the International Committee for Bird Preservation. It might interest bird study groups.

Kentucky Game and Fish Laws, Division of Game and Fish, Frankfort. 1942. 27 p.

This is a compilation of Kentucky's laws relating to (1) Game animals (open seasons, bag limits, permits, traps, license fees and penalties); (2) Wild birds (seasons, limits, guns, dogs, penalties); (3) Fish (method and time of take, nets and seines, limit of size and number, fish ladders, licenses, penalties); (4) Mussels (license, restrictions); (5) Conservation officers and their duties.

This leaflet would be of use to hunters, fishermen, and trappers, within the state of Kentucky.

Laws of the State of Indiana, Department of Conservation, Division of Fish and Game, Indianapolis. 1937. 108 p.

This handbook is concerned with the protection of fish, game, fur-bearing animals, and birds. It gives the laws stating the powers and duties of the game wardens, licenses, game protective regulations, fish, frog, and mussel regulations, and the duties of the directors of the Division of Department of Conservation.

Of value to the hunter or fisherman, the booklet gives the regulations for the state of Indiana.

Man's Friend: The Crow, Emergency Conservation Committee, New York City. September 1937. 10 p.

Scientific stomach analyses have shown that crows destroy many insect pests that plague the farmer. They destroy insects in every month; they have voracious appetites; they search the whole farm for food; they find and attack infestations before the farmer is aware of the danger; and they

do it all for a modest fee in grain, chiefly corn. The Biological Survey made two exhaustive studies. The verdicts of these investigations are that in summing up the benefits and losses from food habits of the bird, the good exceeds the bad, and that the crow is a friend rather than an enemy of the farmer. Evidences of misdemeanors of crows are pulling of seed corn, devouring eggs and young and pilfering corn in the milk; these are balanced by the benefits received from the insects destroyed.

In 1933 "Field and Stream" created quite a furor by issuing a form letter in which Canadian authorities placed the blame for the duck shortage on crows rather than drainage and droughts. Major articles began to appear in all sporting magazines, and such propaganda achieved its purpose for crow hunts and contests were held throughout the country. The influence of ammunition manufacturers is also a factor.

In 1934 the Biological Survey reported that crows were confined chiefly to agricultural areas, and though doing some damage, their chief food was insects. Thus, the Government refused to take a part in the crow control work.

This publication shows that the crow is the friend of man. Lack of knowledge on the part of the farmer, sportsman, and general public accounts for misplaced zeal. If the time, money and energy expanded in crow killing campaigns were spent on the findings of science and research, real conservation would be accomplished.

Maryland Conservationist, Maryland Conservation Department, Game Division, Baltimore. illus.

This magazine is published quarterly by the Game Division. It is concerned with various game problems and current happenings in that field--wildlife administration, feeding grounds for quail, pheasants, rearing of quail, fishing, and other aspects of interest to the hunter, farmer, and the general public.

This magazine gives the problems and solutions as worked out in relation to the wildlife of Maryland. Certainly of interest to Maryland people, it sets a good example for other conservation publications.

Mosquito Control Operations in Tide Marshes in Massachusetts and Their Effect on Shorebirds and Waterfowl, Bradbury, Harold M. The Journal of Wildlife Management. Vol. 2. No. 2. April 1938. pp. 49-52.

Sportsmen and bird lovers reported that there was an alarming decrease in the numbers of migratory fowl that visit Massachusetts marshes during their migrations. In May and June, 1936, the Conservation Department chose the Duxbury Marsh as the experimental area to conduct a fact-finding investigation. Prior to 1931, when mosquito control operations were completed, many different species of migratory fowl had been observed, and on several occasions flocks of American egrets tarried for at least a week. In the survey, the shallow water mud flats were found to be completely drained, with the bottom dried and cracked. No birds were observed. A plan was worked out with the Massachusetts Reclamation Board to recreate an environment favorable for shorebirds and waterfowl, and at the same time check mosquito conditions.

From this report, it appears that a program of migratory wildlife restoration can be carried on without impairing mosquito control. This report should be valuable to other states having a similar problem.

Propagation of Pheasants and Quail, Cottingham, H. P.; Indiana Department of Conservation, Division of Fish and Game; Indianapolis. 1934. 24 p. illus.

Given are detailed descriptions of laying pens, care of eggs, hatching, and rearing of both pheasants and quail. Measurements, materials, and diagrams give adequate instructions for building necessary equipment. The food to be used and a discussion of sanitation and diseases are included.

The purpose of this bulletin is to aid farmers and sportsmen in the propagation of pheasants and quail, the results of which will aid in keeping these game birds stocked in the woods and fields.

Quail Breeding Manual, More Game Birds in America (a Foundation), New York City. 1935. 55 p. illus.

This manual is a complete and detailed description of breeding quail in confinement--measurements and directions for building laying pens, brooder; care of quail during laying season, handling of eggs, hatching in incubators and with bantam hens, and the rearing of the quail are given.

This information would be useful to the various quail farms, and any others interested in the rearing of quail.

Quail Management in Maryland, Wilson, K. A. Conservation Department of Maryland, Game Division, Baltimore. February 16, 1938. 11 p.

This report covers the management results and technical experiences of 27 month's work on 5,367 acres near Salisbury, Maryland. The plan of management carried on a study of food habits which showed that fall and winter quail foods of variety and high nutritive value were scarce; the bulk of fall and winter food consisted of wax myrtle. Feed patches were planted to Lespedeza and partridge peas. A census was taken. A Game Food Nursery experimented with various herbaceous legumes. A summary of results found: (1) that on the Eastern Shore of Maryland submarginal land is especially well adaptable to multiple use conditioning; drainage creates better forest growing conditions and likewise livable habitats for quail and other wildlife; cultivated land strips that grow food for quail also provide fire protection of the forest; (2) good drainage and substantial fall and winter food contributed to the increase of quail; (3) where optimum escape cover exists, predator control is unnecessary; (4) land cultivation increases food supply of predators; (5) plant transition from cultivated land to broomsedge in three years in acid soil; (6) other results are concerned with transition of plants.

Since this report is rather technical its value to the average reader is doubtful. It might be useful to the expert concerned with a similar study elsewhere.

Spiders and Their Kin, Cornell Rural School Leaflet, New York College of Agriculture, Cornell University, Ithaca, New York. Vol. 30, No. 2. November 1936. 32 p. illus.

The best way to learn about spiders and their kin is to watch them. Some may be living naturally in the school

room or house; others may be studied better in class if they are in a handy container. A description of such containers, easily made, is given.

This leaflet describes how spiders travel by web bridges, streamers, running, or jumping. Spiders capture their food by their various kinds of webs. Spiders have a courtship and mating period; the young and their care is described. The enemies of spiders are myriad--birds, wasps, etc. and how spiders protect themselves is interestingly told. The role spiders play in the general economy of living things is suggested. Life-history charts in the leaflet tell briefly of the kin of spiders--characteristics, range, reproduction, habits, behavior, interest to man.

This is a complete and accurate account of harmless spiders--how they live and their behavior. For lower elementary grades the teacher would need to re-work this material but fifth and sixth graders could make use of it themselves.

"Sportsmen's" Heaven is Hell for Ducks, Brant, Irving, Emergency Conservation Committee, New York City. Pub. No. 71. June 1938. 12 p. illus.

Sportsmen are becoming more and more vocal in their efforts to bring back baiting and live-decoys. Their argument centers on a reported increase in the number of waterfowl in North America. Granted that a 25% increase has occurred in the last four years, that does not warrant any relaxation whatever in hunting regulations. Abolition of baiting and live-decoys has educated millions of Americans to the evils of these two methods. Cited are the in-

fluential Illinois Sportsmen's Assoc. and organizations in region of Chesapeake Bay which have monopolies on waterfowl hunting. These have political influence and are constantly agitating for relaxed regulations. The attitude in Congress toward wildlife is improving, year by year. In the main, it has become more conservation-minded.

For the adult, this makes interesting reading.

Tennessee Wildlife, Caldwell, J. C., Bailey, J. L. Department of Conservation, State of Tennessee, Nashville. Bulletin No. 4. 1940. pp. 1 - 30

Tennessee has a comprehensive wildlife program underway based on cardinal principles of (1) research, (2) education, (3) law enforcement, (4) restocking.

A clear statement of the aims of the state for restoring Tennessee's wildlife is given. Given are the causes for the disappearance of wildlife, and value in recreation, economic, and physical wellbeing of the people.

It contains illustrations and descriptions of food, cover, protection and value of common game fowl and fur bearing animals to be found in Tennessee at the present.

The phamplet is presented in a simple readable, interesting manner. It gives a very good discussion of the causes of the disappearance of wildlife.

It can be used by the layman and would probably be of most value when used in connection with education of the public in the "whys" of conservation.

The Biggest Game Preserve, Butler, Lorine L., American

Forests. September 1938. pp. 402 - 407 illus.

In 1907 the Canadian Government set aside an area 4,200 square miles, and called it Jasper National Park. In this area of mountains and valleys, both birds and animals are protected. Many which were disappearing from the region have staged a remarkable comeback. The Rocky Mountain goat, big-horned sheep, moose, deer, elk, grizzly bear, beaver, mountain marmots, squirrels, and Canadian jay are a few of the animals and birds. The stories of their antics around camps and the town of Jasper make interesting reading.

For the adult who has any interest whatever in wildlife, this article is well written.

The Black Widow Spider, United States Department of Agriculture, Bureau of Entomology and Plant Quarantine, Division of Insects Affecting Man and Animals, Washington. E-345. April 1935. 4 p. mimeo. illus.

The apparent great increase in the prevalence of the black widow spider (Latrodectus mactans, Fab.) has aroused great interest, and some alarm. This species is to be found in practically all parts of the country, although it is more prevalent in the Southern States. It seldom enters houses, but frequents out-sheds, woodpiles, toilets, manholes, and similar places. It feeds normally on insects and other small creatures. Its appearance and size are described.

The bite usually causes a stinging sensation, followed by sharp pain and swelling. The pain progresses, the body becomes rigid, breathing irregular, and muscular contractions.

First-aid consists of opening the bite with razor blade to induce free bleeding; apply disinfectant. If severe pain is felt, a doctor should be called without waiting for further developments. A definitely technical procedure for doctors to follow is given.

Since any individual may by chance be bitten by the black widow spider, he should have a knowledge of where they live, their habits, appearance, and a knowledge of the bite and treatment. The leaflet is simply written and contains useful information for all.

The Conservation of Native Birds, (Conservation Week in Schools of New Jersey, 1939) New Jersey State Conservation Committee, Trenton. 15 p. illus.

New Jersey has about 250 species of native birds. Bird structure as related to food habits, (as ducks have webbed feed for swimming to obtain food), are described. Bird banding and migration are discussed. The good done by birds in eating insects, rodents, pleasure from their songs, as food and sport for man are some of the reasons given for protecting birds. Ways of attracting birds to homes, schools and communities are by special provisions of food, water and shelter.

Activities for studying birds are field trips, building bird houses, planting seeds for food, and providing water and bird baths.

In this publication conservation of birds through citizenship training is emphasized, and with children, this is important. This material is very good for teacher use, and offers a varied and worthwhile study of birds.

The Fishes of Nebraska, Nebraska Game, Forestation and Parks Commission, Lincoln. Conservation Bulletin No. 2. Undated. 4 p. illus.

Nebraska is not a state of large lakes or deep rivers, but it does have sandhill lakes, sand pits, rivers and ponds. Conservation of these lakes and streams and the fish in them is one of the great problems of today and a matter vital to every boy and girl of the state.

State laws provide that fish (except in the Missouri River) may be taken only with hook and line. "Bait casting", "fly fishing," and "pole fishing" are described. "Closed seasons" are defined and reasons given for such regulations. Fish to be found in Nebraska are trout, sunfish, black bass, catfish, perch, croppies, rock bass, and pickerel.

This leaflet would have great interest for ten year and older boys, whose natural interest in fishing would be heightened. On their reading level, it is interestingly presented.

The Native Mammals of New Jersey, (Conservation Week in Schools of New Jersey, 1940) New Jersey State Conservation Committee, Trenton. 15 p. illus.

Well known by name and familiar in varied ways are the mammals that live around us. Mammals have definite relationships to man upon which the need for conservation is based. Each plays its definite part in maintaining the balance of nature. Some mammals are valuable as fur-bearers. Mammals have numerous external and internal structural characteristics. The uses of a few of the external characters and the

adaptations of these structures are considered (bushy tail of fox which it uses as protection from winter cold, sharp teeth of rodents, etc.). The various types of homes and foods are discussed. Rabbits, mice, foxes and other animals may often seriously damage crops and property. Ways of control are given. Care of mammals in the classroom for study is described.

This leaflet, for teacher use, gives some very good source material and suggestions for a study of mammals. The level is not given but each teacher might select her own approaches and activities. The bibliography is up-to-date and adequate.

The Preservation of Native Plants, (Conservation Week in Schools of New Jersey, 1937); New Jersey State Conservation Committee, Trenton. 15 p. illus.

New Jersey has three broad geographical areas; the differences in elevation, soil, climate, etc. produce a rich and varied flora. Wild flowers are fast disappearing because of industrial and commercial development, farming, lumbering, grazing, and fires; these are inevitable wherever man goes. Laws have failed to preserve the wild flowers. Establishment of Wild Flower Sanctuaries and educating the the public seem to be the obvious ways of preserving these in the future. Agencies interested in native plants are the State Department of Conservation, State Museum, Garden Club of America, Wild Flower Preservation Society, and numerous other civic groups.

Field study is the best way to know and appreciate wild flowers. Each teacher is urged to make field trips in a

study of wild flowers.

This manual for teachers gives the basic principles of why wildflowers should be protected, destroying forces, and the flora of New Jersey. The material is adaptable to any grade level, and should be helpful. The bibliography is very good.

The Relation of Wildlife Conservation to Agriculture, National Wildlife Federation Bulletin Vol 4. No. 4. Washington. April - May 1939. pp. 4-5

Wildlife has a distinct economic value--in ammunition, fishing tackle, guides, clothing, etc., and this expenditure provides work for many people. The farmer is in large measure the producer of wildlife. In an agricultural nation it is inevitable that wild things must be produced in conjunction with agricultural pursuits. Game produced on the farm furnished the great bulk of the sport for hunters, and the management of those farms spells success or failure for the game that must look to the farmer for food and shelter. The Dept. of Agriculture, Biological Survey, the Soil Conservation Service, and the Forest Service all are cooperating with the farmers in advising them of practices which may be adopted under their program to provide greater benefits to wild life. Likewise control of species of wildlife which are injurious to agriculture is an important feature of the administration of wildlife.

This article shows the part farmers can play in preserving our wildlife, and also benefit from it. Of interest to farmers as well as others interested in wild-

life conservation, it is interestingly written on senior high school level.

The Value of Predatory Mammals, Hamilton, W. J. Jr. New York Zoological Society Bulletin Vol. L, No. 2. March-April 1937. pp. 39-45 illus.

A belated effort is now being made to restore and conserve the wildlife of our continent. Research on fundamental wildlife problems has been started and the results of these have dispelled many popular notions. But one persists--the mistaken premise that predatory species, "vermin," are not compatible with the natural increase of game species. Predators are ruthlessly destroyed on the assumption that their decrease will witness a revival of game. Few realize the interdependencies which exist within the organic world. No animal or plant can live unto itself. This intricate interconnection, we commonly call the Web of Life.

This article is confined to four widespread predatory mammals--coyote, fox, skunk, and weasel. Studies show that the chief food of coyotes is small rodents and insects; of the fox--fruit, berries, small mammals; of the skunk--insects, fruits and small animals; of the weasel--flesh (field mouse) and a few insects. These studies do not reveal these animals to be a very serious menance, though they do kill game upon occasion. Studies of ducks, and grouse show that not all animals commonly suspected of being hostile actually are. Therefore, perhaps no animals should be classed as vermin.

We can credit racial sanitation to the predators by

their culling of the weak and unfit. Every state is aware of the value of furred predators, and protect them while their fur is unprime. Finally, among the assets of predatory animals is their recreational value.

This article is one which helps dispell the widespread condemnation of these valuable mammals. On adult level, it makes interesting and worthwhile reading.

The Waterfowl and Common Sense, Brant, Irving; Emergency Conservation Committee, New York. Pub. No. 64. 1937. 12 p.

Sportsmen say that drainage, drouth, botulism, alkali, oil pollution, crows, sea gulls,foxes, Mexicans, Indians, and muskrats are killing waterfowl. Never a word is said about the deadly barrage poured from millions of shotguns in the hands of millions of hunters. If waterfowl are not to disappear from the continent of North America, action must be taken along two lines: (1) a long-range program must be undertaken to furnish waterfowl with a protected habitat; (2) shooting must be stopped while a breeding stock is built up. Both of these necessary steps fall within the province of the United States Biological Survey. At the present time the Biological Survey has for waterfowl protection, the personnel in its history. The Survey officials have taken a number of steps which show that they understand the plight of waterfowl and want to work effectively against extermination. Yet the steps they take are never quite adequate to the situation as it develops from year to year. There is a puzzling inconsistency between the Biological Survey's knowledge of the crisis on the one

hand, and the ineffectiveness of its policies on the other.

According to a Canadian chart 9/10 of the waterfowl are gone. The latest protective steps--shortening the season and abolition of baiting and live decoys, are progressive ones. But in order to preserve waterfowl, the season must be closed.

In this phamplet significant facts about the existing waterfowl situation are given. Sportsmen are loud and powerful in their clamor for continued shooting. This is a plea for public-minded citizens to express themselves. For adult readers, conservationists and ornithologists, this is interesting reading.

The Wild Turkey, Simmer, John T.; Field Museum of Natural History, Chicago. Leaflet No. 6. 1934. 15 p.

One of the first forms of wildlife to attract attention, in the early days of exploration and settlement in America, was the Wild Turkey. However, with the coming of the white man, the turkey began its retreat and gradually retired to the wilderness, a retreat which has gone on steadily and with varying rapidity.

It has been assumed that the bird was a domesticated one, decended from the Mexican race. The source of the name is in doubt. Certain writers assumed that it came from Turkey, from whence the name. The most logical explanation is that certain of the bird's notes resemble the syllables, "turk-turk-turk."

The plumage, home, food and nesting habits are described.

Enemies of the Wild Turkey are many--wolves, foxes,

raccoons, opossums, hawks, eagles, Great Horned Owl and man. The Turkey has been used as an article of food and object of the chase. Many are the devices and methods of pursuit.

Few attempts have been made to re-introduce the Wild Turkey as a game bird into any of its former haunts. The disappearance of the species has been due largely to the diminuation of suitable ranges and the unfavorable conditions still remain. With the passing of the wilderness the bird has retreated to less inhabited regions. Although not yet extinct, it must be classed with our vanishing game birds.

Simply written, this leaflet tells the story of what has happened to the Wild Turkey. Conservationists should take note--what can be done?

Thirty-first Convention of the International Association of Game, Fish and Conservation Commissioners, International Association of Game, Fish and Conservation Commissioners. August 1937. 68 p.

In 1937 this group met in Mexico City, where many papers were presented--migratory birds and international protection, wildlife problems on the border, American and Mexican National Forests, education in wildlife conservation, and progress made in wildlife problems. These papers are not technical, but are of administrative nature and mean little to the average reader. For the research student, or legislative committee, they might be of help.

Three Seasons at Hawk Mountain Sanctuary, Broun, Maurice; Emergency Conservation Committee, New York City. Pub. No.

61. 1936. 9 p.

In 1934, Hawk Mountain Sanctuary, in eastern Pennsylvania, became the first sanctuary in the world for the birds of prey. It was acquired by the E.C.C. and covers over two square miles of the mountain with the strategic shooting sites. Hunters protested, but to no avail. Cameras and field glasses have supplemented the shot-guns.

In operation three seasons, the Sanctuary has been visited by people from twenty states, Canada, and several foreign countries. Hunters who formerly slaughtered thousands of these birds, many of them beneficial,now use the Sanctuary as an observation post to study their characteristics.

Studies and census' show the trends of hawk migration--volume and flight-direction governed by the wind; heaviest migrations preceded by marked meteorological disturbances in the regions of the north; sequence of species is discussed and correlated with food habits.

This phamplet tells of the accomplishment of one project of the Committee, and the resulting data and recreational aspects.

Utilization of Rock Exposures for Den and Escape Cover by Raccoons, Giles, Le Roy W. The American Midland Naturalist. Vol. 27, No. 1. January 1942. pp. 171-176

The raccoon is generally considered to be a tree-denning animal, and throughout most of its range this seems to be the natural condition. Studies associate a general decline of the raccoon population with the destruction of hollow trees. In the absence of den trees raccoons are known to re-

sort to ground dens. In central Iowa drainage tiles are frequently found in use. In eastern Iowa, Dubuque County, it was learned that raccoons were denning in limestone bluffs and apparently giving preference to this type of den to the customary hollow tree. The investigation covered a nine month period in 1938 and on occasional visits in 1939 and 1940. The valley bottoms and flattened hilltops of the region are pastured or cultivated while the hillsides are mostly in timber. Consequently, as the bluffs are surrounded by trees and woods, the raccoons remain in contact with their habitual cover.

An abundance of available dens in this region is one of the most important factors influencing the annual production of a considerable number of raccoons. The maintenance of a high population reflects the adequacy of the environment, for raccoons are subject to an extremely heavy hunting pressure.

Of interest to the hunter and conservationist, this bulletin describes the adaptation of the raccoon to environment.

What is Happening to Birds in Pan-America, International Committee for Bird Preservation, United States Section, New York City. 4 p. illus.

In most of the islands and countries south of the United States song birds may be shot, netted, or snared, and nowhere are there laws limiting the number of game birds that may be killed in a day. Forty-five kinds of shore-birds receive no protection after they leave our borders. Sixty-seven species of our Warblers spend six

months in countries where little or no effort is made to protect them.

Some encouraging results are being seen in some countries where the Pan-American Section of the I. C. for B. P. is working to correct these conditions. Forty years ago the United States began pioneering in this field, furthermore, we can never hope to rebuild a natural level of supply of migratory waterfowl and shorebirds without the cooperation of these southern countries where so many of these birds spend six months of every year. This is an international problem.

This leaflet gives a group of facts not generally known, and recognizes the importance of encouraging and helping the southern countries for their own, and our interests.

What is Happening to Game in Florida? Partridge, Sarah. The Journal of the Florida Education Association. November 1937. Vol XV. No. 2. pp. 3, 5, 6.

The wild turkey found in Florida is pitted against heavy odds--more hunters; modern weapons; good roads, fire lanes, etc. make breeding grounds acessible. There is a steady diminishing of the bird.

The Florida deer is fast disappearing, and bills to punish law violators and limit and shorten the hunting season failed to pass.

The Florida bobwhite is disappearing and the state should give thought to shortening the hunting season and to farms for protection and propagation.

This article gives an idea of trends in conservation

matters in Florida, and the use of wildlife resources in that state. It could be of use to conservation groups and others as material to influence legislative action in that state.

Where Game Laws are Needed, Pearson, T. Gilbert, International Committee for Bird Preservation, New York City. March 15, 1937. 6 p.

This Committee engaged in a plan to secure information regarding bird protection or the lack of it in West Indies, Central and South America. The results of their findings were: (1) Puerto Rico--35 species of birds protected (useful to agriculture--no game wardens); (2) Dominican Republic --illegal to hunt game birds and mammals for seven months of each year; prohibited to hunt quail for five years (1933-38); song birds protected at all times; (3) Haiti--no laws; (4) Cuba--open season six months of year; (5) Barbados--no laws; (6) Republic of Panama--no laws; (7) San Salvador--use of slings prohibited, hunting of game prohibited during periods of reproduction; (8) Nicaragua--no laws; (9) Honduras -- no laws; (10) Ecquador--no adequate laws; sanctuary for wildlife created on Galapagos Islands in 1935; (11) Peru--no laws; (12) Chile--hunting permitted six months of the year; (13) Colombia--no laws; (14) Bolivia--no laws.

Because of the migratory birds which spend the winter months in these countries, North American conservationists have a vital interest in these matters.

This information would be of interest to ornithological groups.

Wild Animals of Nebraska, Nebraska Game, Forestation and Parks Commission; Lincoln. Conservation Bulletin No. 3. Undated. 4 p. illus.

Many wild animals that once were found in Nebraska in considerable numbers have disappeared entirely or are found very rarely. With certain destructive animals such as the timber wolf this is a good thing. However, with such animals as the deer, badger, and skunk, their going is a distinct loss.

Boys and girls can best learn about animals by seeing and studying their habits and way of life. A table of rodents and other small animals and the nature of their habits is given.

This leaflet on fifth grade level is interesting and presented in good form. In a study of wild animals it should prove helpful.

Wildlife and Cycles, Wing, Leonard; American Forests, October 1937. pp. 496-498, 512 illus.

It has been discovered that periods of scarcity and plenty in some species of game animals alternate with each other; such recurring periods are called cycles. E. T. Seton gathered evidence of cycles and called them "the ebb and flow" of animal life. Aldo Leopold and Charles Elton recently gave vitalizing impetus to cycle thought. Geographic thinking shows that game populations in widely separated areas may fluctuate synchronously, they may show different cycles in one part of the range from those in another, or they may be cyclic in one part and essentially stable elsewhere. The time intervals between similar

manifestations of a cycle are not strictly definite. They have an average length, although the actual length may shift about the average.

Many records of bird migrations have been made and lend themselves well to a study in cycle work. Population figures are not easily obtained nor are they always accurate. The relationship between solar and terrestrial cycles seems well established.

We have so far regulated hunting seasons on the assumption that the next year will be like its predecessor. The logical thing for us to do is to find out what causes the upswing of the cycle and to put it in operation to raise the population or smooth out the laws. We should consider the cycles in our management and administration.

This article should be of interest to the ornithologist, and conservation committees of legislative nature.

Wildlife and the Land: A Story of Regeneration, United States Government Printing Office, Washington; 75th Congress, First Session--Committee Print: Senate. January 1937. 90 p.

This is a report of the Special Committee on Conservation of Wildlife Resources. It describes the drainage period in the early 1900's followed by the droughts of the 1930's when tremendous areas of what had been important nesting grounds in the north, rest areas along the flyways, and wintering resorts in the South were dried up. Great depletion of waterfowl resulted. In 1934 emergency funds for waterfowl restoration were appropriated. It was decided to acquire and restore as nearly as possible to their original state, parts of the great duck-hatchery region of

the Northwest. The Upper Souris project in North Dakota in typical. The structural improvements were completed first, and then habitat improvement projects were undertaken. Maps showing the dominant vegetation on various parts of the refuge were made. Planting of seedlings, nesting islands constructed, cover and food were cared for, and also provisions made for upland game. Other refuges throughout the country are described in detail. At the same time wildlife is being regenerated, cover and protection is being provided to check soil erosion, streams are kept clean, silting is decreased, and the benefits are multiple.

This report gives a comprehensive and understandable picture of the problems of wildlife restoration and management. This report is rather long and not particularly interesting to the average reader: it is really issued to be of aid in supplying information for future legislative programs to restore and perpetuate our wildlife resources.

Wildlife Conservation, Gabrielson, Ira N. The Macmillan Company, New York. 1941. 246 p. illus.

The various programs for the conservation of soil, water, forests, and wildlife are closely interwoven. This interdependence of conservation programs is definitely outlined. Conservation of both soil and water is basic to wildlife, and to the needs of the human race as well. Wildlife stands to gain in any rational conservation program. Water conservation will make possible an abundance of fishes, fur-bearing animals, and aquatic birds--all of which are important to man. Forest conservation and wildlife are closely related. For the past few years forestry practices based

on the concepts of multiple-use and sustained yield have been emphatically to the advantage of wildlife. Grassland restoration should go hand in hand with a definite program for the restoration of wildlife.

Specific problems are varied and many. Every area is definitely limited in its capacity to produce big game. Basic requirements are the same for resident and migratory birds and animals--sufficient and suitable cover and food. Fur animals are a potential source of revenue that can be greatly increased if more knowledge is gained, and if a system of governmental control of trapping on public lands is established. Nongame birds and animals are considered valuable or objectionable only as their habits affect man's interest. Rare and vanishing species are the result of geologic changes and man's interference. Refuges have a definite place in conservation but much more research on management is needed.

Soil, water, forests and wildlife are only parts of one inseparable program; wildlife must have suitable environment, and any use made of any living resource must be limited to not more than the annual increase. Throughout this material great stress on the interlocking ramifications of conservation is made.

Written in simple terms, this material acquaints the layman with the basic principles of conservation, and should help in the restoration program through this knowledge. For the adult, this is easy, readable subject matter.

Wildlife Crops, American Wildlife Institute, Washington.

1936. 23 p. illus.

The American Wildlife Institute, in cooperation with the United States Bureau of Biological Survey, game and fish departments, and the land grant colleges in nine states, initiated a research and demonstration program in which it is developing accurate facts and effective methods which may be profitably applied by the interested public in increasing the annual crop of wildlife on the land itself.

All species of wildlife can be produced in the wild by improving their environment--by increasing the carrying capacity of their range. To improve range there must be exact knowledge of what each species needs--kinds and amounts of food and cover in each season, what enemies and competitors it will tolerate. To learn how to appraise and improve range is the job of research.

Briefly, the program of research needed in relation to farm, forest, and range game, migratory game, fish, fur, rare game (grizzly bear, bighorn, caribou, peccary, etc.); non-game (condor, ivorybill parakeet, etc.); and wildflower is discussed.

The going program, consisting of the nine agricultural college units established, deals mainly with farm game.

This bulletin stresses the importance of research in wildlife management. Much needs to be done, and progress is necessarily slow.

This bulletin should interest institutes and organizations able to sponsor research, and students who have the ability and desire to do research.

Wildlife Report, (Eastern Shore Project), Vaugh, E. A.

United States Department Of Agriculture, Washington. February 1938. 6 p. illus.

In 1936 this project in Maryland was begun to develop wildlife in this area of nearly 7,600 miles, of which five percent was allotted to wildlife. The conversion of old homestead, barnyard and sawmill sites to permanent game food patches seemed advisable, due to the rich soil found thereon. Lespedeza, red clover, partridge peas, cowpeas, buckwheat and corn were planted in 1937. Game food trees and shrubs were planted on marginal lands. Ditches were cleaned. A nursery was constructed for propagation of native wild food producing shrubs, trees, vines and legumes.

Since 1935 there has been a substantial increase in most species of wildlife native to this section--bobwhite quail, rabbit, grey squirrel, mourning doves, woodcocks, raccoons, skunks; as yet no deer have been seen.

This area developed for increase of wildlife by providing food, cover, predator control, has showed increase in wildlife. Development of other such areas should do much to increase and conserve wildlife. This report should interest conservationists and legislators.

Wildlife Review, United States Department of the Interior, Bureau of Biological Survey, Washington; No. 26. February 1940. 54 p. mimeo.

Abstracts of books, magazine articles, leaflets, and government reports are given. All phases of wildlife--control, diseases, food habits, life histories, management, etc.--are considered. This could be used by college students and research workers for sources of material.

MINERAL RESOURCES

The Storehouse of Civilization, Furnas, C. C.; Teachers College, Columbia University, New York. 1939. 551 p. illus. graphs.

Much of this book is a discussion of the utilization of natural resources, pointing out many of the problems that arise. The formation of mineral deposits (geological history), their discovery, recovery methods (mining, pumping, hand-picking, gravitational separations, flotation, chemical, etc.) and the usable ores and reserves are discussed. The reserves of metal mineral deposits of grades that are now considered workable are not now satisfactorily known. The records for iron and copper are fairly accurate. One great need of our mineral industries is for more scientific prospecting; improved techniques for handling lowgrade ores would increase the size of the reserves enormously. Conservation of metals by use of scrap, more efficient utilization, substitutes, and combating corrosion would eliminate shortages for several generations. The supply of nonmetallic minerals (halogens) is fairly ample. However, efficient recovery methods, using new sources, and minimizing waste will prevent future concern. Our present fuel resources, particularly petroleum, are near depletion. Much coal is left in the ground because of faults of the ecomonic organization. Oil is left in the ground because we do not know how to get it out. Most of our power plants and heating furnaces are inefficient. Oversized and inefficient engines use too much gas. Synthetic chemical industries are using more coal and oil as sources of materials.

The scientist will devise new techniques (energy from the sun, new sources of raw material) to meet future needs if there is widespread public support and demand. And that calls up a task for education. A full discussion of social implications (to the individual and the group, mass production, working hours, leisure, etc.) is given.

This volume describes the raw materials with which man has to work and what he does with them. Suggestions are given as to how he can improve some of his processes. The sociological effect of many scientific and technological developments are pointed out.

This book will greatly enrich the background of the reader, and it will broaden his knowledge. It is not intended as a textbook, but the material could well be used in geology, sociology, economics, and geography courses at a college level.

United States Minerals and Us, Palmer, E. L. New York State College of Agriculture, Cornell Rural School Leaflet, Cornell University, Ithaca. Vol. 35. No. 4. March 1942. 32 p.

In the present war, the outcome will greatly depend on whether we have enough war materials or can find substitutes. The leaflet describes the uses of minerals, their sources and New York's place in their production. (1) Minerals and shelter (gypsum). New York ranks first of all the states in the production of gypsum. (2) Minerals and containers (tin, aluminum, enamelware). (3) Minerals and protective coverings (lead paints, titanium, nylon, vinyon). (4) Minerals and machines of transportation (aluminum,

beryllium, magnesium, helium, steel). (5) Minerals and tools (steel, cryolite, florspar, mamganese, nickel, chromium, tungsten, molybdenum, sirconium, rubber, quartz, copper). (6) Minerals and fuel (coal, oil, gas, peat). New York has contributed largely to nation's fuel supply. (7) Minerals and explosives (mercury, glycerine, sirconium, antimony, sulphur, salt, nitrates). (8) Minerals and efficiency of machinery (greases, oils, graphite, emery). New York seconc in production of milstones; has important garnet resources. (9) Minerals and food (potassium, calcium, magnesium, iron, copper, phosphorus, chlorine, iodine). (10) Minerals and control of enemies of plant foods (arsenic).

New York school children can avoid waste of important minerals.

Written for teachers, this leaflet may be of some use in a project dealing with sources of our essential war materials.

Doctor Preaches Conservation, Forman, Jonathan; reprinted from Ohio Conservation Bulletin, State Department of Education, Conservation Labratory, Columbus. Undated. 4 p.

Excerpts from an address given before Ohio Congress of Parents and Teachers are given.

The quality of nutrition depends upon the quality of food and the quality of food depends primarily upon the soil on which is was raised.

The greatest single thing we can do for our country is to see that our people eat enough of the right kinds of food. The next greatest contribution is to join the movement for soil conservation. These two things vitally concern the health, welfare, and mental alertness of our pupils.

This address given before parents and teachers discusses the need for conserving our soils in order to maintain the health of our nation, and incidentally the vigor and continued existence of wildlife.

How Man Satisfies His Need for Food, California State Department of Education, Curriculum Units for Elementary Schools, Sacremento. Vol. XI, No. 4. September 1942. 176 p.

Today's education is related to current problems; conditions show that one-third of the nation is ill-fed; that a large part of draftees were rejected because of poor teeth; great numbers of Americans lack fruits and vegetables yet products of truck farms and orchards are wasted; that numbers of Americans do not have the means

to purchase food necessary for a minimum healthful diet; and others do not know how to purchase wisely nor to prepare food scientifically.

This bulletin is presented in three parts: Part 1 treats man's quest for food from his early beginning to the present day--the influence of climate and soil, migrations and movements of people over the earth's surface, development of trade, commerce, cities and nations, scientific and mechanical inventions, relations of adequate food supplies to problems of war and peace, etc: Part 2 deals with basic considerations regarding nutrition--effect on the individual, signs of good health, functions of food in the body, selection and preparation of foods, sources of nutrients, etc.; Part 3 is a composite account of activities carried out in this study--problems, activities, experiences in (1) study of farm and dairy life (primary level) (2) study of agriculture (intermediate level).

As source material for teachers the bulletin is excellent to enrich the background of understanding and to acquaint her with the problem. The units are suggestive and helpful. The bibliography for teachers and pupils is full. Visual aids available to California teachers are listed.

Nutrition and Conservation, Tennessee Valley Authority, Health and Safety Department, Chattanooga. May 21, 1942. 5 p. mimeo.

Land and the theory and practice of nutrition are inseparable. Man's food is derived from the land, hence the conservation of the land is of vital significance.

Yet the land is slipping away and with it go vital elements. The supply of some of these elements is inexhaustible, but some are not, and without them the inexhaustible elements are useless to us. All of the elements are important, but to the nutritionist the conservation of phosphorus, calcium and magnesium are of most concern.

Before man began to exploit the soil nature maintained a cycle whereby the elements were restored to the soil. Man broke that cycle.

Nature has made an uneven distribution of the soil's minerals (examples in Tennessee are cited). Mineral deficiencies in the soil are reflected in deficiencies in the crops grown and in the cattle feeding on the crops, which ultimately has a direct bearing on man's nutritional problems. Research showing direct connection between soil deficiency and deficiency in the human organizm is still in its early stages. However, it has begun ("goiter belt" in the United States where there is an iodine deficiency in the soil in that area).

A nutritionist's responsibility extends far beyond the problem of daily food requirements.

On a high school level, this article could be used in nutrition or conservation courses to show the direct relationship between health and soil conservation.

Rich Man, Poor Man, Goslin, R. A. and Goslin, O. P. Harper & Bros., New York. 1935. 85 p. illus.

The country in which we live is the richest country in the world, not only in terms of dollars and cents, but in all of those things that are necessary for the making

of dollars and cents. Using 1929 as the basic year, the authors show how our economic system has broken down. We have an abundance of natural resources and the facilities for converting these into usable form. Yet as individuals, our people do not all have enough food, clothes, houses, or medical care. They do not have the income, or enough jobs to purchase these goods.

As a nation, we are rich--as individuals poor. All of us depend upon other people having money and the desire to buy what we have to sell. There are certain reasons why exchange of goods and services are impossible--fewer jobs, low wages, debt, limited supply, war, depression, etc.

In order to use our wealth advantageously we need to distribute goods as a service rather than for a profit. The government should be the agency to take charge of those fields of activity which are essential in providing the necessities of life. Social ownership is needed in providing (1) an unvarying medium of exchange, (2) control of credit, (3) conserving natural resources, (4) ownership of power, (5) production of goods, (6) transportation of of goods, and (7) distribution of goods.

This book is simply and non-technically written. The graphic illustrations tell a clear, understandable story. Scientifically, it is shown that government ownership of certain phases of our economic system would assure to all of our people enough food, shelter, etc. for the good things in life. However, the American way is not in accord with social ownership, and the advisability of organization

and functioning of such a system is questionable.

This publication could be used as a text in economics at a senior high school level.

MISCELLANEOUS

A Study in Conservation, Minneapolis Public Schools, Minneapolis, Minnesota. 1940. 336 p.

This bulletin gives a general overview of the work done in conservation in Minneapolis Public Schools. Children's experiences, reports, illustrative material, and teacher's accounts are given. The topics covered are soil erosion and depletion, water conservation, forest preservation, mineral resources, and wildlife protection.

As one reads the reports and experiences written by children from kindergarten through the sixth grade, one has the feeling that they have learned much in certain fields of conservation. The accounts show how varied and extensive were their interests. Their excursions, collections, building, search for information through writing of letters, and other activities were rich and meaningful. The integration of conservation and history, geography, English, mathemetics, and art is easily identified. Much use was made of community and state interest and information.

Of value to teachers contemplating teaching of almost any field of conservation on an elementary school level, this bulletin gives excellent ideas and suggestions as to what can be done. With each topic is a very full and complete bibliography of books, magazines, phamplets, government materials, and encyclopedias which were used with success by teachers in carrying out this study.

A Tentative, Suggestive Special Unit on Washington History and Government, Washington Department of Public Instruction,

Olympia. September 1941. 7 p.

In this unit, on junior high school level, the outline considers the problem of man adjusting himself to the natural environment and adapting its resources to his needs--in the Stone Age, the Indians, in the river valleys of the Nile, Tigris and Euphrates, and in United States and Washington state. Particular emphasis is on soil, plants and animals.

To be used in a world history class, the content outline is well organized, but no suggestive activities or procedures are given; the bibliography is very meager.

Abstracts of Bulletins No. 581-595, Circulars No. 86-90, and Other Publications During 1940, Jackson, A. A.; Agricultural and Mechanical College of Texas. July 1941. 51 p.

The abstracts given are those available from the Texas Agricultural Experiment Station and cover animal production (diseases, food, beef and dairy cattle, poultry, swine, sheep, goats), apiculture, fertilizers and soil, field crops (cotton, corn, sorghum, grasses, small grain, legumes, pasture crops), horticultural crops (fruits, native plants, poisonous plants, vegetables), and home economics. Most of the articles are technical and of interest primarily to the specialist.

Aids to the Student of Conservation, Visher, Stephen; John Wiley & Sons, Inc. New York City. 1957. 32 p.

This publication is designed to be used in connection with the book, Our Natural Resources and Their Conservation, by A. E. Parkins and J. R. Whitaker. On each chapter is a set of questions. One group is review work on the chapter

and the answers can readily be found in the text material. Another group consists of thought-provoking questions. These are excellent and aid greatly in applying facts to present-day situations. They could well be used as guides for discussion.

This is an aid usable by both student and instructor.

America's Capacity to Produce, Nourse, Edwin G. & Associates, The Brookings Institute, Washington. 1934. pp. 1-157.

This is the first of four volumes in which the authors plan to establish the trend of capital expansion in the United States for the period 1900-1930, and to estimate the capacity of the industrial plants built and whether or not these plants are utilized to their full potentalities. This first volume is concerned with raw materials, fabrications, and services.

Under the heading raw materials is included (1) agriculture--the conclusion being that considerable investments in the form of buildings, fences, wells, etc. have become unproductive, and that while there is no demonstrable trend toward power utilization of the farmer's capital plant, its ratio of use in absolute terms is low; (2) mines--(a) coal --production has not reached capacity, (b) coke--much obsolete machinery, but efficient equipment working close to capacity, (c) petroleum--production, refining, and storage are not paralleled and have failed to utilize their full capacity, (d) copper and other nonferrous metals--copper--percentage of utilization about 80% of rated capacity, zinc--below capacity, aluminum--output close to capacity. The output of the metals was expanded by the war and underwent a post-war adjustment,

and after 1923 the ratio of capacity to demand improved. Cement and other earth materials experienced rapid growth from 1909-1913 and culminated in a large excess of capacity, a period of stationary development during the World War, and again a surplus of capacity was apparent in 1929.

This study of our raw materials is important in conservation because it indicates how much more rapidly our resources may be utilized, and brings us to the fact that wise use planning, without waste, is necessary and will be increasingly important. Production in practically all phases increased to near capacity during World War 1, and now that our country is in the throes of World War 2, we can be sure that even more resources are being used.

This book would be most useful for college students in a study of technologic or industrial economics.

America's Natural Wealth, Lieber, Richard; Harper & Bros. New York City. 1942. 340 p. illus.

This straight-forward account of America's resources, their use and abuse, is presented by a man whose entire life has been spent in the field of conservation. America as a nation has been singularly fortunate. Natural wealth is the source of our prosperity and the basis of our national institutions. Unfortunately, we have carried on a terrific waste in nearly every direction. Few recognize the presence and influence of minerals though they are the life-blood of our entire power age economy. Forests, lakes, streams, mountains, and fertile valleys are all integrated. The complex and highly integrated problems of general land use are closely related to private ownership, prevalence of farm

tenancy and share cropping. The problems of floods, droughts, erosion, reclamation of submarginal lands and irrigation are too large and varied to be met by the individual or the state. Our parks (national and state) have been established to preserve examples of natural wonders and wildernesses. Preservation should take precedence over use, yet all parks should be self-supporting. The history of the conservation movement is traced, and the work achieved by each event--C.C.C., Soil Conservation Service, Bureau of Reclamation, National Resources Planning Board, etc. We as a nation have had a rather haphazard approach to conservation, yet viewed in its totality, there appears a general trend in the direction of needed national action.

Throughout the material the author shows the great need for a unified approach to problems concerning the conservation of our natural resources. For effective, intelligent, and comprehensive action, all conservation matters should belong in one department. The attitude of the public and the lawmaker would be strengthened, and existing disorganization in Federal Conservation would be freed of overlapping and conflicting jurisdictions, bureaucratic jealousies, waste, and inefficiency in the present chaotic arrangement.

Written for the layman as well as college students, this account gives us much for thought. The piece-meal approaches and activities in conservation are clearly shown; a national policy is greatly and urgently needed. Written in an interesting style, the book has much educational value for all adults. The appendix of chronology of events affecting conservation from 1626-1942 should be helpful to many students.

American Democracy Anew, Odum, H. W., Meyer, H. D., Holden, B. S., Alexander, F. M. Henry Holt and Company, New York City, 1940. 600 p. illus.

This book is a study of the nation as a whole. Within the frame-work of the American picture, the problems studied are the physical and cultural background, the people, the institutions, and the testing grounds of the people (welfare, technology, planning, etc.). Then too, a picture is given of the South in its richness and variety, and its place in the total nation. Throughout the study emphasis is placed on the natural wealth and its affect on the nation. The existence, development, distribution and use of natural resources condition the nature and the quality of civilization and culture. In America, in recent years, the conservation, development, and use of natural resources have become new themes for education and government, and for economic and cultural enrichment. There are in reality two great sources of societal wealth: the people and nature. The greatest benefit and utilization of each depends upon the other. Changes in the American scene have been brought about by science, technology, and natural geographic environment. The six major regions of the United States present different views of life. The critical problem of technical ways of guaranteeing a genuine balance of welfare and wealth throughout the nation is one that we must meet.

In the regional study of the South, the main point brought out is the superabundance of natural and human wealth, and the lag in the measure of its technological wealth, artificial wealth, and its institutional modes of life and culture.

The trend in this lag is definitely forward at the present.

This inventory of the American scene stresses over and over the basic importance of our resources to every aspect of American life. The problems of American democracy are presented and interpreted in relation to the historical background, and to the realities of our resources and our regions.

At high school level, as a text for social studies, and as supplementary material for economics, geography, or conservation courses, it contains much rich material. The questions for discussions, the problems set up and the bibliography are very good.

American Nature Association Quarterly Bulletin, American Nature Association, Washington; Vol. 1, No. 1. April 1938. 30 p.

Some of the fundamental conservation problems confronting the United States are (1) administrative--The Game and Fish Commission and the other agencies administering wildlife resources are greatly involved in politics; revenue largely from sportsmen; (2) waterfowl--law protection not enough; (3) predators--no program should be undertaken without scientific knowledge; (4) refuges--no hunting or trapping allowed; (5) poison and traps--every possible precaution should be exercised;(6) soil--great need for a more scientific and practical attitude; (7) National Parks and Forests--extension of road facilities, recreation, lumbering, etc. should be limited; (8) pollution--control by Federal Government; (9) roadside commerce--regulated by zoning; (10) Federal Bureau Reorganization--transfer of Grazing Division to the Department

of Agriculture, and merged with Grazing Division of United States Forest Service; Civil Service throughout bureaus.

This is the first number of the Quarterly Bulletin and is devoted to a discussion of the general problems of conservation and the attitude of the Association with respect to them. The proposals given are sound and constructive. This magazine is interesting to any individual or group sincerely and unselfishly interested in the future of our natural resources.

American Regionalism, Odum, H. W. & Moore, H. E.; Henry Holt & Co. New York City. 1938. 641 p. illus.

Regionalism is a term used in a variety of ways and with many meanings. One must interpret the meaning in relation to the relatively specific usage. As used in this volume, regionalism means the societal region combining a relatively large degree of homogeneity measured by a fairly large number of indices available for a relatively large number of purposes or classifications. This definition implies a unifying function. It is a tool and a technique for various objectives for planning, for decentralization and distribution, as these relate to population, wealth, and sovereignty. The natural regions of the United States are considered as six areas. The indices used are: climate; mining and industrial regions on bases of coal, iron, petroleum and other minerals; in terms of characteristics of the soil (many subdivisions); regions of natural vegetation; river valleys,, and many others. In the T.V.A. may be found all the elemental factors of American regionalism. Cultural regions are con-

cerned with other indices. Various historical and cultural aspects of regionalism are those of the geographer, the anthropologist, the ecologist, the political scientist, the economist, and the sociologist.

The six regions and flexible sub-regions presented in a general outline framework are: (1) The Middle States and Their "Middle West" are the heart of the nation's bigness and complexity (an agricultural-industrial group); (2) The Northeast and Its New England--people, financial resources, national manufacturing, centers of art, literature, and drama; (3) The Southeast and Its "Old South"--the "most American" in range and abundance of flora and fauna, land and forests, its tempo and pattern of ruthless exploitation of resources, both natural and human; this region is nearly always in the lowest quartile of the 48 states by all indices; (4) The Far West and Its California--great "unity in diversity"; (5) The Northwest and Its Great Plains--an inland rural region, manufacturing and industry conspicious by their absence; has the problem of mastery of physical environment (land and water); (6) The Southwest and Its Texas--"least American" of all the regions, youngest historically, its ultimate wealth unpredictable because of the many possible developments. These divisions illustrate the theoretical and historical aspects and practical implications of regionalism.

This volume is a picture of contemporary regionalism in the United States. It is an inventory which serves as a basis for planning in the light of realistic situations. The regions are viewed as a whole and also as constituent parts

of the national unity.

The maps and charts supplement the printed page. The bibliography is very complete and up-to-date. This material is well written but could be used only by advanced students of sociology, geography, or history since an extensive background is necessary for understanding and application.

Arkansas' Natural Resources, University of Arkansas, Fayetteville. 1942. 451 p. illus.

The various state and national conservation agencies have done much to secure the proper use and development of the natural resources of the state. Every citizen must assume a sense of responsibility for carrying out the conservation code. This responsibility requires some knowledge of the problems and their suggested solutions. Some of the important problems are (1) erosion--one-sixth of the cultivated crop land has been severely damaged; (2) minerals --oil, natural gas, coal, bauxite, zinc, and others are being exhausted at a rapid rate; (3) flood damage is increasing; (4) forest products are second in value of the state's resources, and less than six percent of the forest area is now in virgin or old growth timber; (5) plant life--Arkansas has over 2,600 varieties and species of plants, and little thought is being given to their protection except in recreational areas; (6) wild animal life--there have been tremendous decreases in the wild animal population, and in some instances, the loss of the species. Each of these problems is discussed in detail and suggestions as to how to work out conservation programs for each resource are given through protection, elimination of waste through extracting, replenishing, economical use,

and substitution, or reclamation.

In 1939 the Arkansas Legislature enacted a law requiring the teaching of nature study and conservation in all public schools. In order to make available facts and suggestions on the state's resources, this bulletin was written. It is excellent source material and very complete. The bibliography is very good. Included in the appendixes are conservation laws and statistical date for the state. The bulletin stresses distribution, conservation, and wise use. Primarily for the use of those preparing courses of study, it contains authoritative information for all persons interested in promoting public welfare in Arkansas by means of the proper care and use of the state's natural resources.

California's Natural Wealth, (A Conservation Guide for Secondary Schools). Bulletin of the California State Department of Education. Vol. 9, No. 4. (December 1940). Sacramento. 124 p. illus.

To make adequate and comprehensive plans for the use, development, and enjoyment of its natural resources, an understanding of California's geography is needed. The land forms, rivers, lakes, etc. are discussed. In planning to prevent waste,conservation must (1) be integrated, (2) include study of land use, (3) correlate land use with water development, and (4) be in cooperation with all groups and agencies.

Of all resources, water stands first in the estimation of most California people. The rainfall distribution, underground waters, floods and flood control, and run-off are discussed.

With the rapid settlement and increasing demand for more food, more land has been cultivated and protective vegetation largely removed. Agencies actively interested in public education in the field of conservation and application of conservation measures are the Agricultural Extension Service of the University of California and the Soil Conservation Service.

The flora of the state includes forest, desert, grassland, chaparral, sagebush and woodland plants. The primary objectives of conservation should be to prevent deterioration and hasten the natural process of restoration. Problems of forest management are discussed. The recreational and scenic resources have received increased recognition as a valuable asset of the state.

California has a wealth of mineral resources. Methods are recommended for their conservation through production, manufacture, and substitutions.

Conservation in the curriculum should be meaningful and not confined to written work. Surveys, interviews, experiments, excursions, books, visual aids, etc. should be techniques used in a study of resource problems.

This bulletin contains a wealth of material for the teacher and suggestions for integrating conservation with courses in natural science, social studies, English, mathematics, art and home economics. It contains excellent references (books, bulletins, phamplets, magazines, maps) on each topic discussed.

For use in secondary schools, it is good source material for the teacher.

Choose a Book About Things to be Conserved, Mackintosh, Helen K. and Bathurst, Effie G.; United States Office of Education, Government Printing Office, Washington. 1941. 19 p.

This is an annotated list of books (for children) on mammals, frogs, snakes, fishes, trees and forests, birds, soil and water, minerals, wild flowers and plants, and insects. The reading level for each book is given.

The descriptions are interesting and should help librarian, parent or teacher in selecting books for children.

Conference on Education in Conservation, National Wildlife Federation, Washington. February 1939. 69 p. illus.

This conference, held in Detroit, was called for the purpose of finding out how conservation could be handled through education. Various papers presented activities in several states. T. E. Benner spoke on some of the conflicting points of view which needed to be harmonized. He favored correlation of conservation and other subjects, not a separate course or subject of conservation; educational leadership through the United States Department of Education, American Council on Education, N.E.A., Progressive Educational Association, and others; not bring conservation into the schools through securing laws requiring its teaching, but through the mediation of competent leadership; contact leading publishers of textbooks for knowledge of textbook possibilities; the problem of training of teachers, and the building of bibliographies.

Indiana's conservation program of organization of conservation clubs throughout the state was described. Tenne-

ssee's program consisted of meeting with teachers' groups in curriculum conferences, curriculum building, traveling exhibits on birds, animals, forestry products, land erosion charts and supplying teachers with materials on conservation.

Cornell's longtime program of issuing their Leaflet on related material for conservation study is described.

At Zanesville, Ohio, using the Muskingum Conservancy District as a labratory, teachers are trained, films shown, experiments carried on, and conservation is the "core" subject.

In Wisconsin, selection of teachers with ability and desire to do something for conservation, supplying materials for use, and integrating conservation throughout all levels, is the program.

The National Wildlife Federation has a three point plan for conservation education--(1) statement of fundamentals, (2)groups to be approached, (3) development of educational methods.

This is an excellent example of educators getting together and exchanging ideas, and an organized group taking their share in the work. For all educators, teachers, and administrative officers, this is interesting and worthwhile reading.

Conservation, The American Forestry Association, Washington.

This magazine, published every two months, is a digest of current articles on the conservation of natural resources. The articles include all phases of conservation. The cost is 20¢ a copy or $1.00 a year.

This magazine reflects the trends in conservation and

the research being carried on. The magazine is usually 50 pages, so not all the conservation news can be included; however, it gives a fairly good picture of conservation, since digests are made from a great number of sources. The articles are non-technical and should interest the layman and adult student.

Conservation, Building America Vol. 2, No. 7. Americana Corporation, New York City. 1937. 31 p. illus.

America has great natural resources--fertile soil, dense forests, adequate rainfall, and rich mineral deposits. A large part of the land has been destroyed by the plow and axe. As a result farms and grazing lands have washed down to the sea. Cattlemen and sheepmen made large profits but too many cattle and sheep destroyed the short grasses in large areas. During World War 1 the World called for more wheat. Western farmers plowed up thousands more acres of prairie lands. Heavy winds and dry years resulted in the Dust Bowl. To save our soil we can (1) halt water erosion, (2) prevent wind erosion, (3) stop loss of minerals, and (4) prevent overgrazing. The Soil Conservation Service is working on all four phases. The United States Government is preserving forests by (1) setting aside areas, (2) protecting from fire, diseases, etc., (3) reforesting, and (4) leasing land for grazing and timber cutting. Steps are also being taken to preserve our minerals.

This pictorial study unit discusses (1) what has caused waste, (2) what American people are doing to halt the waste, (3) what the government is doing.

This is a well organized unit written for school use

and the general public. Parts could be read by sixth graders. It gives a clear picture of the problems, it causes, and ways of solving the situation. The pictures are good and aid in interests and explanation.

Conservation, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol 29, No. 3. January 1936. 32 p. illus.

Ideals of conservation should be broadened to include not only interests in the streams, the rocks, and the living wild things, but interest in man himself. Problems associated with man's health, wealth, safety, and general prosperity, both as an individual and as a member of a community, belong in the field of conservation.

The activities included in this leaflet are concerned with (1) wildlife--providing shelter and food for birds, visit sanctuaries, investigate fur-bearers in New York, discuss use of steel traps, make casts of tracks of birds and animals, locate bird's nests, record number and kinds of snakes you find, etc.; (2) soil and water--notice effects of heavy rains on your yard or school grounds, collect samples of earth for experiments, make trips to note how waterways are used, etc.; (3) woodland--observe destruction caused by fire and disease, observe cut trees for rings, note values of wood, study wildflowers in your vicinity, etc.; (4) general activities--build a library (bibliography given), take excursions, make maps, carry out experiments, etc.

The suggestions in this leaflet are primarily for teacher supervision. Much use is made of the community. It should be very helpful.

Conservation, Murphy, Robert C.; Bulletin of the Garden Club of America; January 1938, pp. 39-50, March 1938, pp. 26-36.

The conservation movement is the public reaction to abuse of natural resources. Thus far it is largely in the negative stage of protest. In primitive North America we had what naturalists call balanced nature. Destiny decreed the building of a new civilization. Some parts of our country have been damaged more than others. In Virginia the loss of wildlife, including flowers, birds, fish, fur-bearers and game, has been largely unnecessary. The forests are fundamental; they are necessary for the holding of ground water, protection against erosion, and home for wildlife. Overgrazing and erosion are two evils from which Virginia has suffered less than her near neighbors, yet we easily see the effects of erosion in Virginia streams if less easily on the land.

The importance of all insects and mammals now classified as "vermin" is discussed.

Conservation is a broad and intricate subject. The time for guess-work has passed. One of the most encouraging signs of today is the growing willingness of the public to recognize the validity of information derived from the researches of naturalists.

This article points out the needs of Virginia, the interrelationships of nature, and the necessity for understanding conservation principles on the part of the public. Given before an interested group of Garden Club members and the Izaak Walton League, it helps clarify the situation somewhat.

Conservation, Murphy, Robert C., Bulletin of the Garden Club of America. May 1940. pp. 40-49.

The natural riches of North America are in a far more critical state than has even been generally realized despite widespread publicity during the past few years. Whether we consider forest products or fisheries, the story is a similar one of appallingly depleted supplies. The shortages are partly masked by the facilities of modern transportation. Proper land use and wildlife conservation are interdependent, and to some extent, interchangeable terms. The things they stand for form a fundamental basis of our national economic life, and the latter can hardly be separated from our cultural life.

It is curious that the press has never caught up with the importance and publicity value of this great socio-economic need. The space given to "rod and gun" is in sharp and unfortunate contrast to the attention paid to conservation. The history of conservation is largely a record of interdenominational squabbles. Uniformity of purpose needs to be developed.

Our national point of view seems to be one of delusion--that this nation abounds in wild territory and all the things that go with it. We need to drive home the point that many of the "things people have always known" are none the less false.

In this address the education of the general public is stressed--that our riches are being depleted, and aware of this, the public will act. The article would be of interest to those who are concerned with conservation.

Conservation and Citizenship, Renner, G. T. and Hartley, W. H. D. C. Heath & Company, Boston. 1940 367 p. illus.

"Conservation is the preservation of our natural resources for economical use, so as to secure the greatest good to the largest number for the longest time." It is no longer a small matter. It is rapidly deepening and widening stream of forces in our national life. Most of our resources have been widely misused; despite enormous waste, America has become a strong, large, and wealthy nation. But the age of abundance is over; we are now entering an age of readjustment and conservation. Very complete discussions of our forest, soil, water, wildlife, mineral, and human resources are given. These are dealt with as to the extent of the nature and importance of each resource, how the resource has been used and the extent of misuse, and the steps which might be taken to remedy the damage and to prevent further waste. Accompanying each unit or chapter are questions, suggestive topics for reports, notebook projects, cartoons, drawings, field trips, etc. The appendixes give sources for motion pictures and supplementary reading. The pictures in the book tell a vivid story.

This book, intended as a text for junior and senior high students, is written in a simple and readable style. The material is well organized. Social and economic implications are stressed; wise use and planning on the part of American citizens is necessary, and is well taken care of in this book. As a text for use in conservation or geography courses, it is excellent; as supplementary reading for civics or economicsit is well suited.

Conservation and Defense, Edge, Rosalie; Emergency Conservation Committee, New York City. 1941. (Report for 1940). Pub. No. 84. 11 p.

The E.C.C. urges for the Porcupine Mountain area a plan to give the Forest Service the management of the part of the forest that is desirable for commercial forestry; and that portion of the area which should be preserved be made into a national park. The E.C.C. supports bills which provide for pure streams. The E.C.C. continues to support regulations for increase of waterfowl. With the National Audubon Society, the E.C.C. opposes wild bird plumage being sold for millinery.

Publications of the E.C.C. in 1940 were two new units on waterfowl and hawks. Another on predators is ready for publication.

In 1940-41 the E.C.C. opened an intensive campaign to save the Trumpeter Swan. A lecturer was sent to Idaho and Wyoming. He had traveled more than 2,500 miles.

This summary of the Committee's activities is varied in scope and interestingly presented. It serves to keep the public informed and indicates the trend of events in certain phases of conservation work.

Conservation and Nature Education, Wildes, F. A. Minnesota Academy of Science, University of Minnesota, Minneapolis. April 13, 1935. pp. 25-31.

The greater portion of Minnesota's adult citizens have an imperfect or undeveloped idea of what constitutes conservation. This lack is due to the fact that while young they were not led to understand the full value of things

about them. The work of a comprehensive conservation program demands the attention of schools and colleges. Nature study had a prominent place in the schools forty years ago. It was discontinued in some schools, probably because of lack of training of teachers. Its revival is of utmost importance if we are to fully realize the continuing value of nature's gifts. Man has shorter working hours and more leisure. We should sense the importance of conserving our resources for recreational purposes as well as for economic reasons. The full importance of all phases of conservation must be instilled into the minds of the young during the formative period of their lives, so that when they become adults the lessons of youth will become a part of their make-up.

This article stresses the value of education as a part of the conservation program. Discussed in non-scientific terms are the needs of conservation and the part education can and must take. Written for the average reader, it relates education and conservation.

Conservation and the Kentucky Teacher, Gilpin, James J. Kentucky Conservation Department, Frankfort. Undated. 19 p. mimeo.

During the early years of a child's life is the time to begin to develop the principles of conservation. In the lower grades the objective of such work is to give the child opportunity to establish mental attitudes toward conservation. Attitudes so formed will definitely direct his interest and behavior in later life. Some emotional factor should

be introduced if that teaching is to become an integral part of the child's thinking. Sentimentalism should be avoided but friendship, thrill of discovery and pride of possession are emotions which are wholesome, and do not offend the intelligence of either adults or children. Establishing friendly relations between children and other living things is the most important work in the lower grades.

In the junior high school years children are more concerned with their own outdoor sports--hiking, hunting, fishing, trapping. Concepts of subjective values should not be stressed too strongly.

At the senior high school level boys and girls are learning to think subjectively. They rapidly become the champions of "lost causes," and if guided, one of the great opportunities is to direct this crusading spirit into the movement for the protection of our wildlife and the wise use of our natural wealth.

The suggested activities for use in conservation studies are varied--excursions, exhibits, home projects, etc.

The phamplet gives a good overview of conservation principles and what the teacher can expect and on what to place emphasis.

Conservation Bibliography for Wisconsin Schools, Wisconsin Department of Public Instruction, Madison. February 15, 1941. 7 p. mimeo.

This is a list of books (annotated) about conservation in general, material available from the Wisconsin Conservation Department, the State Agricultural Department, and magazines helpful in a conservation program. All the material

listed is on a junior or senior high school level.

The list is not long, but the material is up-to-date and very reliable. It should be helpful to teachers in gathering material for a conservation program.

Conservation Bulletin for Use in Schools of New Hampshire, Garden Clubs of America (and affiliated clubs). New York City. 1941. 40 p.

This bulletin is compiled of articles written by various people (Audubon Society, New Hampshire Conservation Department staff, United States Department of Agriculture, etc.) who are either vitally interested in conservation or are experts in their field. The articles are rather broad in their scope--the topics being conservation education, wild flowers, birds, insects, fish and game, trees and forests, soil, and water. These might be of help to the teacher. The strong point of the bulletin is the bibliography which includes factual materials, story and picture books and phamplets and magazines. Some of the books indicate the age or grade level. This list would be of great aid in gathering source material.

Conservation by the People, Edge, Rosalie, (Annual Report for 1941), Emergency Conservation Committee, New York City. 1942. Pub. No. 85. 13 p.

The activities carried out in 1941 by the E.C.C. included (1) protested against the planned army camp and artillery range at Henry Lake, Montana because it was the flyway of the few remaining Trumpeter Swans (successful); (2) engaged George Marler to lecture in Idaho on the Trumpeter Swan;

(3) protested the use of poison by Fish and Wildlife Service; (4) protested Senate Bill 1476 which would permit slaughter of deer in Florida because deer harbor a tick which carries cattle fever; (5) worked to save Cook Forest in Pennsylvania; (6) campaigned against proposed ski-trails and tows on Whiteface Mountain in New York; (7) opposed amendment to plumage law in New York; (8) worked to accomplish closed season on waterfowl.

This Committee is primarily concerned with legislation regarding conservation of wildlife and forests. It seems aware of the problems and actions throughout the country, and takes steps to keep the public informed and urges them to protest against detrimental measures.

Conservation--Come and Get It! Edge, Rosalie, Emergency Conservation Committee (Report for 1938), New York City. March 1939. 24 p. illus.

After much campaigning, the Olympic National Park was established. Hawk Mountain Sanctuary is now established, independently of the E.C.C. An organization of sportsmen, Ducks Unlimited, purposes to save wildfowl by improving the marshes of Canada and thus the waterfowl of North America. The author says this is for general knowledge; to gunners, this organization promised longer open seasons, larger bag limits, repeal of some regulations. The E.C.C. plans to fight any action taken by this group. The E.C.C. urges building fish-ladders on the Grand Coulee Dam to save decreasing salmon in the Columbia River. The E.C.C. issued six publications in the interest of conservation during 1938.

This bulletin informs the public of some of the problems

of our nation, what this group is doing, and urges all citizens to do their part by writing the proper authority and by contributing funds to the C.C.C.

Conservation Education, prepared by the Federal Writers Project, W.P.A. State Department of Public Instruction, Harrisburg, Pennsylvania. Bulletin 214. May 1939. 108 p. illus.

One-twelfth of Pennsylvania's people live on farms which cover more than half the state. There is relatively little good land. Erosion is caused by water. Control measures are under the State Agricultural Department, the State Soil Conservation Board, and the Department of Forests and Waters.

Flood control is important because floods are frequent. The state Water and Powers Resources Board is charged with pertinent date (surveys, hydraulic works, etc.). The Health Department maintains constant supervision of water supplies and sewage.

Forests are necessary to control erosion, maintain water levels, control floods, etc. To handle forests properly and give assistance, the Department of Forests and Waters is active.

The state, because of conservation and restocking programs, has an abundance of wildlife. The state has nine fish hatcheries, 132 game refuges, 41 cooperative farm game projects, and four game farms.

The state leads all others in mineral production. Coal, cement, natural gas and petroleum are the main resources. New devices and methods of production help avoid waste.

The state has taken steps in the conservation of human resources through health education, crime control, safety legislation, and social service. A description of the tuberculosis program, pneumonia program, social security, etc. are given.

The historic sites, parks, caverns, and scenic spots of beauty through the state are listed.

This bulletin for teachers is excellent source material; at the end of each chapter are lists of classroom approaches. These are usually discussions or written reports. I feel that there should be more variety in these. The films and film strips for each subject are excellent. The bibliography is adequate but its use by elementary school children is questionable.

Conservation Excursions, Bathurst, Effie G. United States Office of Education, Government Printing Office, Washington. Bulletin No. 13, 1939. 1940. 106 p.

Excursions are especially useful in a study of conservation because natural resources in the form of birds, trees, forests, etc. which compromise the subject matter to be taught cannot be brought into the schoolroom in their natural state. The value of an excursion is to give the pupils a practical acquaintance with conservation as a problem which is basic to their own and the community's welfare, and a working knowledge to help them participate in its solution.

The purposes of excursions vary. Some are taken for pure pleasure and result in appreciation of the outdoors and its benefits. Some result in added knowledge. Other trips are taken to acquire knowledge not available in the classroom

or home. Sometimes trips are taken to find materials for experiments. Conservation activities often require excursions for their consummation. Some trips are taken to interview experts in different fields.

The profits and pleasures gained are in proportion to the teacher's planning. Preliminary visits, reading and study, consideration of desirable results, transportation and equipment are a part of teacher planning.

Follow-up activities may include records such as diaries, journals; letters of thanks and expressions of appreciation; displays and exhibits; school or class newspapers; map-making; models in sand-table, etc.

In the appendix is a list of suggestions on (1) where to go and what to see, (2) what to do, (3) further activities in a study of soil, water, flowers, trees and forests, birds, fish, minerals, history and culture. The bibliography is good.

This bulletin is excellent for any teacher who plans taking her class on an excursion. It covers every aspect, and gives valuable, workable suggestions. This is especially valuable to beginning teachers.

Conservation Films in Elementary Schools, Bathurst, Effie G. United States Office of Education, Government Printing Office, Washington. 1941. 38 p. (Bulletin 1941, No. 4)

Motion pictures are a vivid aid in understanding how the Nation's natural and human resources have been wasted and how the remaining supply can be conserved. Films adapted to teaching conservation in the elementary school are not lacking in number or quality. Films should be selected carefully

and the viewing group should have adequate preparation to insure understanding and appreciation. Standards in the selection of films include (1) content in relation to the curriculum, (2) suitability for the grade, (3) contribution to educative objectives set up for the unit of instruction, and (4) technical elements in relation to photography, continuity, titles, etc.

Both teacher and children need careful preparation if they are to profit by the use of films. The teacher should preview the film and organize her procedure by planning ways of using this material in learning situations before and after the showing. The children should be prepared by reviewing facts and experiences already gained, suggesting items to be particularly noted, by assigned oral and written reports to be gained from material in the film. Follow-up activities may be in the form of discussions, experiments, summaries, reports, card-files, etc.

The annotated list of films on conservation gives source of film content, educational objectives, grade level, treatment of material, background desirable, and follow-up procedures.

This phamplet is designed to help schools teach conservation more effectively through the technique of using moving pictures in the class room. To the teacher, committee, director in charge of visual education, or the individual who desires to use films in relation to conservation studies, it would be of great benefit since it suggests standards for the selection of films, and ways of applying them in good classroom practices.

Conservation for Victory, (Annual Report), Edge, Rosalie, Emergency Conservation Committee, New York City. Pub. No. 88. 1942. 26 p.

The activities of the E.C.C. in 1942 covered the following: (1) published three free phamplets; (2) contacted editors of newspapers and magazines on current conservation issues; (3) worked out campaigns for saving South Calaveras Grove, in California, to save Sitka Spruce on Olympic Peninsula; (4) gave publicity to cutting of timber on Porcupine Mountains on shores of Lake Superior in Michigan and urging that it be brought under the control of National Park Service; (5) protested against building of a dam on Clarion River which borders Cook Forest in Pennsylvania; (6) worked toward establishing of Jackson Hole National Monument; (7) sponsored a lecture tour in Montana and Idaho for protection of Trumpeter Swan; (8) protested against destruction of the Bald Eagle and Duck Hawk.

This report gives the program and workings of this Committee for 1942. Much of the effort was on educating the public through lectures and leaflets; the Committee is also active in legislative matters concerning conservation phases. This is one means of giving our government some idea of the interests and desires of the people relating to these matters. However, I have a feeling that the lumber industry, gun and ammunition manufacturers, sportsmen and other groups put much more effort and pressure behind their desires.

Conservation--How It Works, Edge, Rosalie. Emergency Conservation Committee, New York City. 1940. 20 p.

This is a report of the work done in 1939 by this Committee, namely: passing of the bill to create Kings Canyon National Park through campaign efforts; campaigned for additional area to Olymphic National Park; worked for addition of 6,000 acres of recreational area to Yosemite Park; issued publications on conservation (units).

An interesting criticism of the Audubon Societies in their organization for training and service of conservation workers is made.

The bulletin shows how conservation workers can work for certain phases and legislative action.

Conservation in Curriculum Building, (a Symposium of Talks), Raymond, Anne; Soil Conservation Service, Southwest Region, Albuquerque, New Mexico. September 1941. 43 p. mimeo.

This group of talks was given before an educator's meeting in Spokane, Washington. It describes what had been done in four states of the Southwest (Arizona, Colorado, Utah, New Mexico). Over a period of five years superintendents, supervisors, principals, teachers, and pupils have worked on building their curriculum on their own communities. Administrative problems which arose were numerous. Should conservation be a separate subject? At what grade level should it be started? Is geography the place for it? What about time in the already crowded curriculum? How should conservation programs be initiated? Is there any carry-over in the home?

In her talk before the classroom teachers, the writer tells briefly how units were developed at different grade levels. Her discussion of field trips is very full.

At the meeting of the Adult Education Group ways of

carrying out conservation programs with cattlemen, P.T.A. groups and others were discussed.

The talks given before the School Board members described what can be done by that group--study groups, workshops, contact business men, work in harmony with the state planning boards, Soil Conservation Districts and other community efforts to solve big problems.

These talks are written in a most interesting way and touch on questions asked by those in the educational field. They describe what has been done in one section of our country, and are suggestive for other areas.

Written for all those interested in conservation, this bulletin shows that an understanding of the basic resources is a necessary part of all-time education.

Conservation in the Education Program, Bristow, W. H. and Cook, Katherine M. United States Department of Interior; Office of Education, Washington. Bulletin No. 4. 1937. 78 p.

For years America was confident that her resources were unlimited. Over a period of years waste as well as use depleted our natural resources. Fortunately, a nation-wide conservation movement is underway. The Government alone cannot accomplish the full purpose of conservation unless it is accompanied by an effective program on a nation-wide scale. Many states have enacted legislation 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 to elementary and secondary levels. Another aspect is teacher education (both in-service and pre-service). Materials of conservation lend themselves effectively to curriculum planning; conservation cannot be confined to any one subject; the primary concepts can be understood in their elementary form by young children. Conservation is generally taught in connection with another established subject such as elementary science or geography. Courses of study cited which include conservation are those of Virginia, New Jersey, Maryland, Pennsylvania, South Dakota, Iowa, and Michigan. Special bulletins on various phases are issued by Wisconsin, California, and Delaware. More activity units are being developed. A list of teacher-instruction institutions and courses offered is given. A brief bibliography includes government publications and general references.

This is a general survey of educational programs and what various states are developing to promote conservation. The bulletin is primarily for curriculum planning groups for it gives some guiding principles for incorporating conservation in the program of instruction.

Conservation in the United States, Gustafson, A. F., Ries, H., Guise, C. H., Hamilton, W. J. Jr. Comstock Publishing Company, Inc. Cornell Heights, Ithaca, New York. 1939. 431 p. illus.

The problems of conservation vary with the different resources and are associated with the supply of each remaining, the possibility of renewal, present-day demands, and the use of substitutes. The resources of our country are classified as: (1) Soil and Water--two-thirds of the United States

shows erosion in various degrees; streams are clogged; reservoirs are filled with silt. Erosion and loss of plant nutrients are the two soil problems. Crop residues, manure, rotation, and green manure crops return soil nutrients. Tillage, rotation, close growing crops, contouring, strip cropping, terracing and grass reduce water erosion. (2) Forests, Parks, and Grazing Lands: Forests are discussed as a source of material, as a protective influence, as recreation areas, as home for wildlife, and as grazing lands. Losses have occurred from fire, insects, diseases and logging methods. Publicly owned forests are usually efficiently managed. Privately owned areas usually have no provision for second crop growth, and little fire protection. Abandoned farms need to be returned and restored to forest growth; forests protect watersheds; wildlife should be on a sustained yield basis. Measures to insure continued forests include protection from fire and insects, regulation of grazing, conservative logging, increasing public ownership, reforestation and practiced forestry. Parks are usually well managed. Grazing lands need restoration and proper management. (3) Wildlife--food value, business, aesthetic value. Decline has resulted from settlement of the country, destroying habitat, pollution, over trapping, lack of food, and other causes. Conservation measures include legislation, refuges, restocking and education. Organizations concerned with the protection of wildlife are the United States Bureau of Biological Survey, Soil Conservation Service, Bureau of Animal Husbandry, Bureau of Entomology and Plant Quarantine, National Park Service, the Audubon Society, and state agencies.

(4) Minerals--of vital importance to the industry of the nation. The reserves of coal are distantly exhaustible; known reserves of oil and gas are definitely limited; iron is plentiful, but known reserves of gold, copper, zinc and lead are limited. Reducing waste from mining, separation processes, economical use of finished products, and the use of scrap are conservation methods.

The complex problems of conservation are presented in a non-technical and general way. Our resources are in varying stages of depletion and must be treated accordingly. This volume presents the basic facts. It gives a good understanding of current problems. For adult students and other interested readers it gives a good general background of information on conservation.

Conservation of American Resources, Elliott, Charles N. Turner E. Smith and Company, Atlanta, Georgia. 1940. 672 p. illus.

The subject matter of this book is presented in twelve units. Unit 1 deals with all resources, past and present, attitudes toward conservation, and reasons for wasteful exploitation. A definition of conservation and all it implies, and a discussion of what may be expected in the future through conservation activities is given. The other eleven units deal with the resources--(1) game birds, (2) game animals, (3) fish, (4) forests, (5) national parks, forests, monuments, and state parks, (6) land, (7) water, (8) minerals, (9) animal and plant life, (10) landscape, and (11) planned conservation. In each unit a picture of past and present conditions is given, with conservation practices which have

been and are being organized and which would be practical. At the end of each chapter within the units are questions and suggestions for activities, as well as excerpts or special messages from fifty of America's conservation leaders. Many codes and pledges which may be applied to conservation problems are given.

The presentation of subject matter is most pleasing and interesting. The language is simple (all technical words are defined in the appendix). The material is closely related with history and social studies in that it shows the effect of America's expansion (territorially and industrially) in the exploitation of her natural resources. The organization is such that the units may be studied as they are needed. The supplemental reading is full and up-to-date.

This is an excellent basic text in a conservation course or as a supplementary reader or source book. Primarily on a junior high school level, parts could be used at a sixth grade level. The pictures, messages, and general organization make this excellent teaching material.

Conservation of Our National Resources is Our Best National Defense! Hoemaker, Carl D. National Wildlife Federation Bulletin. Vol. 4, No. 2. Washington. February 1939. p.6.

We in America are faced by an enemy of far greater power for destruction than could be inflicted by any foreign enemy. This enemy is within our very boundaries. This enemy is attacking our potential national security. Our natural resources are the greatest bulwark against invasion we possess. We can best strengthen our national defenses

by preserving and restoring these resources. This great enemy includes soil erosion, floods, droughts, fire, and wasteful use of forests.

This article points out what has happened to our country and deplores further exploitation. The article should be of interest to all--conservationist and the general public.

Conservation of Our Natural Resources, Havemeyer, Loomis and Associates. The Macmillan Company, New York City. 1930. 541 p. illus.

The real purpose of intelligent conservation is to guard against "willful waste"--a problem of efficient development and wise utilization. Within the borders of the United States are the greatest natural potentialities of any nation on earth. This enormous wealth has been the basis of American prosperity. The principles of conservation are different for the different resources, yet conservation of one resource is closely related to that of others. It is an interlocking subject. Man's place is one which is considered (diseases, accidents, labor, etc.) as well as his social and industrial obligations relating to the resources. Each resource is considered separately with regard to existing conditions in 1930 and possible bettering of the situation. Minerals, which are far greater in the United States than in any other nation, need an educational program and intelligent legislation. Water, an ever renewable resource, should be used as much as possible. Our forests are vast and of exceptional value from an economic standpoint. The original forest area has been greatly reduced by numerous forces. Forest depletion results in economic injury to all.

Greatly needed are educational programs, good forestry practices, refinement of logging, milling and manufacturing processes, reforms in taxation of forest lands, research and regulatory legislation. The demands for agricultural lands are less urgent, but we need to keep soils in high state of fertility. Depletion of soil through erosion and loss of essential elements is discussed. Better farm practices, soil management, and tenure policies have direct influence on the productiveness of soil. Wildlife as an aesthetic, recreational and economic resource is discussed. The federal, state, and private associations working toward conserving our wildlife are considered.

This book was written by a group of seven men, each an expert in his field. Based on Van Hise's work of 1910, the basic principles of conservation are the same now as then. This is good foundational reading in conservation problems. The situation in relation to the different resources is constantly changing. Research and experiment introduce new substitutes and industries, new projects are instigated, new services are offered by federal and state governments, and estimates and figures have altered. For an up-to-date account of our resources, this work would be of questionable use. For basic principles and knowledges it is excellent for advanced students.

Conservation of Our Natural Resources, Holmes, J. S. North Carolina Department of Conservation and Development, Division of Forestry, Raleigh. March 1, 1940. Circular No. 84. 8 p.

This bulletin, prepared on junior or senior high school level, gives a general overview of conservation and natural

resources.

Conservation means perpetuation through wise use. It involves utilization without waste and regeneration without diminuation. The natural resources associated with a conservation program are soils, waters, forests, minerals, wildlife and human. The agencies working toward achievement of conservation development are the United States Department of Agriculture (Forest Service, Soil Conservation Service), United States Department of Interior (Biological Survey, National Park Service), North Carolina Conservation Department and Agricultural Extension Service. Numerous civic organizations have active interests in conservation.

The leaflet might be used in an approach to conservation problems wide in scope.

Conservation of the Nation's Resources, Flynn, H. E. and Perkins F. E. The Macmillan Company. New York City. 1941. 373 p. illus.

America is a land of great wealth in resources--both natural and human. The location, size, and climate are among our resources. The natural resources are: (1) Water--the conservation problem is to use as much water as we can. Water has many important uses--for agricultural purposes, power, navigation, disposal of waste, home for wildlife, and recreation; (2) Vegetation of two kinds is considered, (a) forests which are needed for lumber, to control erosion and to hold the ground water table. Great waste has resulted from fire, insects, diseases, and inefficient lumbering and manufacturing. Reforestation has been started, but a much expanded program is needed. (b) Grasslands are needed as

cover for soil, and as a source of food supply for cattle and sheep. Fire, overgrazing, and cultivation have destroyed great areas. Regulation of grazing, seeding, and non-cultivation are the best remedies; (3) Land--efforts to conserve the public domain have culminated in National Forests and Parks. Two acute problems of soil conservation are replacing plant foods and erosion. Crop rotation and fertilizers will restore the food. Many varied programs are needed to control erosion. The problem of tenancy is a factor also; (4) Wildlife--increased population, good roads, the auto, drainage, and pollution have taken their toll of wildlife. To restore it we need increased education, legislation, and refuges; (5) Minerals--our minerals, both metals and fuels, have been exploited mainly because of competetive practices. Other losses have resulted from mining, smelting and inefficient manufacturing methods. We should use substitutes, build up scrap piles, and control price fluctuations to make our minerals last; (6) Human resources are the most important of all. The problems of health and safety are foremost. Various agencies work for better personal health and public health. Safety in industry, in agriculture, on the highway, and at home is of vital importance. Social security and education are also means of human conservation. A flexible total plan for using our resources in accordance with social justice is needed. The planning for conservation in this country is under the direction of the National Resources Planning Board; community, state, municipal and regional planning is also under way.

This study of the multiple problems of conservation gives

a broad view of all our resources, and stresses social attitudes toward them. It emphasizes the conservation of natural resources to the extent these resources are used for the welfare of the people.

Written as a text at high school level, it is interesting and well balanced. Review and discussion questions for each chapter are splendid. The bibliography is up-to-date; films available for each topic are listed.

Conservation Practices in the Elementary School, United States Office of Education, Information Exchange, Washington. 1941. 30 p. mimeo. (No longer obtainable)

This is a group of articles, descriptions, and one unit (on erosion) which tells what has been done in various schools in studies of conservation. They are brief summaries of activities for daily lessons which teachers have written.

The material is inadequate since no description of the unit or content material is given. The reader knows nothing of what has gone before and is at a loss to understand the purpose of this material. The bulletin is of little or no value since the instances cited are entirely unrelated to each other or to any continued program.

Conservation, The Resources We Guard, United States Department of Interior, Washington. 1940. 29 p. illus.

The United States has more natural resources than any other nation on earth. All the efforts toward the wise use of these resources is called conservation. The Department of Interior is composed of agencies whose duty it is to help guard our natural resources. These agencies and their functions

are listed: namely Bureau of Reclamation, Office of Indian Affairs, Geological Survey, Bureau of Mines, The Fish and Wildlife Service, General Land Office, National Park Service, The Grazing Service, Bituminous Coal Division, The Bonneville Power Administration, Petroleum Conservation Division, Soil and Moisture Conservation, Division of Territories and Island Possessions, The Puerto Rico Reconstruction Division.

A bibliography on conservation material (available from Supt. of Documents, United States Government Printing Office) is given.

This is a very handy leaflet in that it gives briefly the work of each agency listed above. On a high school level, it would furnish easy reference to any government agency concerned with conservation and its work.

Conservation Workbook for Women, Tennessee Department of Conservation, Educational Service, Educ. Pub. No. 7. March 1, 1941. 27 p. illus. Nashville.

This guide briefly discusses Tennessee's six basic natural resources--soil, water, forests, wildlife, minerals, scenic and historical sites, and the work of the Conservation Department. Then are given suggestions as to what women, as individuals and as clubs, can do to help solve conservation problems. These suggestions include preparation of news releases for county and city newspapers, sponsor activities in connection with schools, aid in development of community forests (nature trails, bird sanctuaries, gardens, etc.), erect signs for fire prevention on highways and in wooded areas, winter feeding of birds, roadside planning and demonstration areas, develop roadside parks, and aid and sponsor Conserva-

tion Summer Workshop programs.

This handbook gives many usable suggestions for women's groups and their aid and advance of conservation. It should be a great help to garden clubs and other organized groups. Source material in the form of publications and movies available from the Tennessee Department of Conservation is listed; these would be of value to teachers.

Conserving Our Natural Resources, American Association for the Advancement of Science. 1937. 12 p.

This is an annotated list of books which give a background for understanding, and a select list of reliable up-to-date books and phamplets on current information relating to conservation. The list covers (1) general conservation, (2) land use, (3) forests, (4) water, (5) oil and gas, (6) minerals, (7) wildlife, (8) magazines dealing with general and specific conservation topics.

The reading level of this material is on a senior high school, college, and adult one. In compiling material, this leaflet would be of value to teacher, librarian, or one in want of general information on conservation.

Conserving Our Resources, Keso, Edward E. Times-Journal Publishing Company, Oklahoma City. 1940. 201 p. illus.

Anything that nature provides that is necessary for living or a better enjoyment of life is a natural resource. The resources considered are soil, forests, water, minerals, and wildlife. Two chapters are devoted to each of the above topics. The picture of our country and the uses made of each of these resources is given. Then a discussion of what may

be done to replenish such resources as are renewable, and what may be done to best utilize what we have left is given. The various national and state agencies working on conservation problems are mentioned in connection with each topic. The various kinds of parks, and their place in conservation are noted. Resources would have little value if there were no people to enjoy or use them, and in many ways the human resource has been neglected. Physical defects, diseases and accidents cost much in time and money. Agencies working for conservation of our people are the United States Department of Health, state departments, the Red Cross, and others. The final chapter gives an account of conservation in Oklahoma. Mechanical methods of erosion control, terracing, strip cropping, and gully control are used to save the soil. Water is a big problem in that state, and reservoirs and flood control projects are under way. The shelterbelt, tree nurseries, and Forest Service programs are described. Mineral resources are mentioned, but no predictions for the future are given. The State fish hatcheries, game refuges, and various organizations have furthered the study and conservation of wildlife. The State Board of Health, State Highway Patrol, and others are working to conserve the human resources.

This account gives a general view of our country and the condition of our resources. No details are given, and the material is rather elementary and superficial in presentation. It is written in simple, easy language. Since this is a text intended for use in junior high school, it is good material for a beginning course. Parts could well be

used by fifth and sixth grades.

Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol. 32, No. 1. September 1938. 75 p.

This leaflet, designed for teacher use, gives material on the elementary science library. Every librarian and teacher responsible for guiding children is confronted with the problems of book selection. Standards for selection are (1) the content should (a) add to the child's store of appropriate and desirable knowledge, (b) be of sufficient literary and artistic merit to foster an appreciation of the beautiful; (2) it should be character-forming; (3) the form or make-up should be considered.

In the list of books given, librarians and science specialists considered them with particular attention to science content, presentation, and make-up. Annotations include type of material, and grade or age level. The topics covered in the list are general nature study, animal life (mammals, birds, fish, amphibians, reptiles, insects), plant life (flowerless, flowering, gardening, forestry), the earth and universe (stars, sky, ancient life), and physical science.

This list is excellent and every teacher should be familiar with it if she is compiling books for any phase of nature or science study.

Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. (Teacher's No.) Vol. 34, No.1 September 1940. 63 p. illus.

In this number, for teacher use, are given many and

varied field experiences in natural science in elementary schools. Things to do or places to go are given, then follow-up activities or suggestions are planned. No teacher could or would desire to do all these experiences, but could select the ones which would meet her own needs. The field experiences suggested are (1) outdoor temperatures in fall and winter, (2) study of evergreen trees, (2) a snowbank, (4) electrical transmission line, (5) speed of sound, (6) cameras and picture taking, (7) visit a gravel deposit, (8) shapes of pebbles, (9) visit an elevated place, (10) visit a road cut, (11) study of a well, (12) study North Star, Dippers, (13) study of an unpainted building, (14) visit a pile of junk, (15) visit a filling station. At first glance, these field experiences seem to be made at random. However, their use in making maps meaningful, soil erosion, electricity, sound, air, physical changes, etc. are excellent. These field trips may be fitted in their proper units or programs, and should make the study of science and nature more interesting and concrete.

Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol. 36, No. 1. September 1942. 63 p.

The purpose of this leaflet is to suggest aids to teachers in the teaching of war and conservation. The cartoons may be redrawn on the blackboard and help develop a sound philosophy. Among the major problems are those of personal safety, of health, of food, of transportation, of elimination of waste, of power, and of getting along together. Under each of these general topics the subtopics are illus-

trated--as in the problem of health (1) waste disposal, (2) insect menace, (3) municipal price, (4) war, health, and local food.

The bibliography for teachers and elementary school children is very good.

This leaflet would be useful as supplementary material. Since illustrative material is hard to find this type helps supply the need.

Creeping, Sprawling, Climbing Plants, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol.32, No. 4. March 1939. 32 p. illus.

In this leaflet are described the sprawling and creeping plants (knotweed, purslane, carpetweed, chickweed, etc.), flower-garden sprawlers (nasturtiums, wandering Jew, sedums, pansies, some violets, etc.), sprawling house plants (asparagus fern, ivy, etc.) pasture and lawn creepers (clover, wild crane's bill, moneywort, ground ivy, bindweed, etc.), and marsh plants (liverworts, water ferns, duckweed, etc.). The cover and root protection given the soil by such plants is emphasized throughout. The descriptions and general habitat should enable children to find and observe these plants.

In a study of erosion problems, or a study of plants, this leaflet should be most helpful.

Curriculum Content in Conservation for Elementary Schools, Bathurst, Effie G. United States Office of Education, Washington. (Bulletin 1939, No. 14). 1940. 79 p.

The activities required for studies in the field of con-

servation are varied with respect to the nature of the resources studied and the inclination and needs of the pupils. Systematic instruction can be achieved by placing emphasis on different phases of the subject or on different activities at definite places in the curriculum. Other plans consider the general problems of conservation as one major social interprise in phases of which children participate from year to year. Some classes develop their study around each of the country's resources. Each teacher will necessarily organize material to the needs and interests of her class. This bulletin presents the resources of wildlife, minerals, water, forests, and soils. Activities and techniques are given under these headings: (1) understandings to be developed, (2) participation in activities, (3) attitudes and continuing interests.

This bulletin for teachers suggestseducative values of conservation in their relation to curriculum content. The teacher can consider them in her plans and can better help her pupils to participate in conservation enterprises. The activities include many and varied experiences. The bibliography is good.

Developing the Program of Conservation Education in Ohio, Fink, Ollie E. Science Education. March 1941. Vol. 25, No. 3. 7 p.

Conservation education will be included as a major concept in the revised elementary curriculum in Ohio. Careful planning is most necessary. These plans begin in the first grade. Each grade advances from the foundation of understanding established in the preceding units. Units carefully

planned should have sequence, and depth. A great choice of activities will provide the opportunity for each teacher to travel paths according to her creative interest, provided she guides the class toward the goal, "the conservation way of living." In the elementary school the primary emphasis will be on the science principles; in the secondary school attention will be given to the social and economic implications of the interrelated conservation problems.

In this new program "teaching the teacher" is of importance. Literature for the teacher, conservation labratory for teacher training (established in Zaleski State Forest) and assistance in the development of programs for teacher training institutions have all been instigated. Units are being outlined, literature cited, and plans for continued development are under way.

This brief summary of Ohio's plan is a very interesting article. All curriculum study groups should be interested.

Developing the New Program of Conservation Education in Ohio, Fink, O. E. Reprinted from Ohio Schools. January 1940. Columbus. 4 p. illus.

In Ohio the State Department of Education and the Division of Conservation and Natural Resources are co-operating in a curriculum project in conservation education. Objectives of the project are to give the pupils (1) insight into the nature of the world, the interrelationships of man and other forms of life and the physical world, (2) information, habits, and attitudes conducive to health, (3) growth through a variety of purposeful scientific experiences, (4) emotionalized attitudes toward the natural environment and its interrelationships,

(5) ability to solve problems through an examination of evidences, (6) willingness to act intelligently on the basis of evidence and (7) a sense of social responsibility.

Units, materials and techniques are to be worked out. The units developed should contain scientific principles which are to be taught, activities, and learning situations.

When this bulletin was issued Ohio was just beginning the project in conservation education. This is an explanation of the basic principles of conservation and the goals toward which the schools expect to work.

Of special value to teachers of Ohio, the article might well be used by any group initiating such a project.

Development of Resources and Stabilization of Employment in the United States, National Resources Planning Board, Washington. House Document No. 142. January 1941. 409 p.

The objective of public works construction is to provide public facilities required for the maintenance and progressive development of the standard of living of American people. Functional development policies are planned on a six year basis. Land-use objectives are closely related to public works. Each specific proposal must be considered as to costs and benefits, financing, timing, and regional plans. There should be a unified national water policy based on adequate, reliable data. Proper account of social and economic benefits, prudent financing, settlement of controversies over interstate waters, orderly priority as to needs, and other points must be considered. Objectives of energy resource developments are (1) to develop energy resources with a view to a strengthened national economy, (2) provide effective measures

for coping with national emergencies, (3) promote better understanding of the problems of conservation, (4) provide for continual planning and investigation. Specific objectives for coal, petroleum, water power and electric energy are peculiar to each resource. The projects recommended for 1942 in six major catagories are listed: water use and control, land, transportation, defense, government plant, and housing. Regional development plans for each of the ten regions are given.

These recommendations are the framework of a long-range policy of planning. They include a six year program of public construction and a statement of related future policies and plans of the Federal Government. Prepared with estimates, surveys, investigations, it gives an over-view of recommendations to meet employment needs and efficient use and development of our resources. Primarily for Congressional legislation, the regional studies could well be used in adult courses in geography, economics, and conservation.

Education in Conservation, National Wildlife Federation, Washington. March 1940. (Committee on Education Phamplet No. 2). 39 p.

The general objective of the National Wildlife Federation is the restoration and perpetuation of America's natural resources through an aroused and enlightened citizenry. The task of developing a sound public school program in conservation education has been assigned to the Committee on Education. The progress of this group is the subject of this phamplet. The fundamentals of the program were outlined and received hearty approval by many leaders and institutions. The next

big problem was teacher training and materials. Most teachers are sympathetic with the idea, but they simply don't know what to do. Books, phamplets, etc. are numerous but are not on a level that children can understand. Films, slides, pictures and materials of non-technical nature are the great need.

This discussion touches on two vital problems facing conservation education--teacher--training and materials. Much is being done and has been done since 1940 in both these phases, yet it is a slow process and a complex situation. This is excellent reading for teachers and administrators.

Economic Georgraphy, Ostrolenk, Bernard; Richard D. Irwin, Inc. Chicago. 1941. 776 p. illus.

Economic geography deals with the study of man's utilization of the earth, its climate, soil, ingredients, and changes man effects in this environment to adapt it to his use. Man's ingenuity brings to light an endless spectrum of resources, yet we need to recognize that these are limited. Optimum use of these resources has for its first objective the elimination of waste. Concepts of conservation involve a conflict between the immediate private and corporate interests, and a long-time social interest. Conservation frequently demands that pecuniary accounting be ignored. In a survey of our resources we note that the nation cannot maintain its farm plant unless it radically alters its system of farming. Modern development of our water resources has come to be a multiple-use activity as evidenced in the T.V.A., Columbia and Colorado River projects. Minerals are discussed as to distribution, methods of extraction and industrial uses, substitutes, and new industries. The ratio of total normal

forest drain to growth is now 2:1. Conservation of forests is intimately related to agricultural, industrial and social problems. Forest products are numerous, important, and essential. Taxes, centers of use and risks cause devastation. Forests and their relation to rainfall, erosion, navigation, and water power are discussed. Multiple use of national forests has been adopted and should extend to private ownership. The foremost conservation problem facing man is to learn to live peaceable. This brings us to problems involving social, political, and economic factors. Education must take an important role in this problem.

This very complete and detailed account of the problems of the productive activity of the people in terms of natural resources covers every phase of our resources and the industries relating to them. The role of government, the force of technological development, and the consequences of the changing interactions of resources are stressed. Geographic, economic, and social aspects which are a part of the development of the resources are discussed. The maps and statistical data are most helpful. The bibliography is excellent.

This material could be used at college level in courses in economic geography, geography, and conservation.

Facing Conservation Facts, (Annual Report for 1936) Emergency Conservation Committee, New York City. Pub. No. 80. 1937. 10 p.

In 1936 the Committee published eight phamplets, worked for the saving of the Sugar Pines in Yosemite Park, the establishment of Mount Olympus National Park, supported Dr. W. T. Hornaday in his work for a closed season on migratory waterfowl,

improved Hawk Mountain Sanctuary, helped launch the Northwest Conservation League.

The Committee cooperates whenever possible with all who work along similar lines, and urges all nature lovers and those interested in saving our resources to work with them.

Fifty Years of Conservation in New York State, (1885-1935) Whipple, Gurth; Conservation Department and New York State College of Forestry, 1935. 199 p. illus.

While Europe sent spoilers and the progenitors of spoilers she also sent conservers of the forest. Intermittently, in Colonial times, voices were heard urging action for the protection of the American woods. As early as 1698 governors of New York were advocating forest protection and forest production. Controversies started, legislation was proposed and failed, but in 1885 the Forest Commission was authorized. Many administrative problems were before the Commission. Logging operation, trespassing, land acquisition, taxes and other problems were to be decided. Forest fire prevention and control was one of the major issues, and 1905-1910 saw the first tower-patrols built. The Commission turned its attention more and more to reforestation and forests and fishery departments were placed in charge of scientifically trained men under civil service. More attention was directed to protection of wildlife, and in 1913 steps were taken to begin recreational developments in the State Parks. Public education--lectures, publications, newspaper releases, movies, etc.--was put on a comprehensive basis. Comprehensive land surveys were initiated, hatcheries and game farms were

built, programs for control of disease and insects were begun, forest schools were arranged, and other progressive plans were laid. Conservation in this state is a personal matter with twelve million people. The work of the Conservation Department touches every section of the state; during the fifty years a solid foundation of administrative work has been laid, and a continuous policy established, both of which enable the state to hold its gains and to make new advancements.

This history presents a connected story by tracing events from cause to effect. It is concerned chiefly with the legislation of the state as applied to various aspects of conservation. It could well be used as a text in senior high schools.

Film Loan Library, Tennessee Department of Conservation, Nashville; Educational Publication No. 3. Undated. 6 p. mimeo.

The Educational Service of the Tennessee Department of Conservation maintains a film loan library for the benefit of schools and conservation minded organizations. Films may be borrowed free of charge. Both sound and silent, colored and black and white films are available. Thirteen films on birds, fishing, duck hunting, game farms, forests, and minerals are available. Other agencies (United States Department of Interior, Department of Agriculture, National Federation of Wildlife, etc.) also have films on forests, game, rivers, etc. Each film is described very briefly.

This list of available films should be especially useful to teachers, and to leaders of conservation groups.

Good References for Conservation Education in Elementary Schools, United States Office of Education, Government Printing Office, Washington. 1938. 16 p.

This is a list of selected publications dealing with conservation topics--birds, erosion control, floods, flowers, human life and health, minerals, nature trails, soil, spiders, trees and forests, wild animals. Listed are forty books, phamplets, etc. on basic factual material, and ten on methods of instruction. Each book listed is annotated and grade level given.

This list would be helpful in gathering references for teaching any of the phases of conservation listed above. Sources of visual materials and periodicals are listed also.

Helps in Teaching Conservation in Wisconsin Schools, Wisconsin Department of Public Instruction, Madison; Curriculum Bulletin Vol. 1, No. 2; May 1938. 102 p. illus.

Part 1 of this bulletin gives a bibliography for soil resources, water resources, minerals, scenic and historic resources, forests, and wildlife. The bibliography for each resource is given by grades--one through eight. Part 2 is concerned with teaching methods or procedures for each grade. These activities are integrated with reading, language, mathematics, social studies, and art. They are varied and include all types of approaches and methods--reading, writing, excursions, experiments, collections of material, making notebooks, etc. These activities are intended for use in elementary grades only.

This is an excellent guide for teachers for it integrates all phases of conservation with all the other closely related

educational activities in the grades. The experiences are varied to take care of all interests, and are very worthwhile.

Industrial Location and National Resources, National Resources Planning Board, Washington. December 1942. 352 p. illus.

The selection of a location for a manufacturing plant usually requires the weighing of a number of interrelated factors. Production and distribution problems require consideration of the sources of raw and semi-manufactured materials, fuels and power, needs for special labor skills, availability of management, transportation, and service facilities, water supply, and markets. Organizational factors which influence the locations of particular industries are size of the plant, extent to which operations can be integrated with related processes, and the proximity to other industries. Contrary to common belief, the great majority of manufacturing plants do not use basic raw materials directly. When materials are perishable or when processing results in great weight or bulk reductions, locations of plants are necessarily close by. Industries dependent on foreign sources for materials tend to be attracted to seaboard locations. Mineral resources (fuels) are usually more localized geographically than are the leading non-metallic resources. Manufacturing is concentrated mainly north of the Ohio and east of the Mississippi. It is, however, reaching out to new regions, particularly in the Southeast. Food production is concentrated for the most part in the eastern half of the United States. Fish resources industries are largely peripheral, the West Coast states being the most productive. Fibers, furs, and hide industries are

concentrated in a few areas (Cotton Belt, Louisiana). Forest and lumber industries occupy the outer portions of our country.

This report is an analysis of the various factors influencing manufacturing location decisions. The problems of making such decisions are outlined. It should be helpful to both private industry and governmental agencies faced with problems resulting from wartime industrial expansion and conservation to peacetime needs. It should aid in developing a more stable and productive economy.

Looking Ahead with Tennessee Schools, State Department of Education, Nashville. 1937. pp. 8-250.

This is a bulletin on the improvement of instruction for Tennessee. It gives the aims of the curriculum committee --making the learner's needs and purposes the first consideration. Effective learning comes through meaningful experiences so the committee has presented many units--from first grade through high school. These units are based on situations applicable to conditions in Tennessee. The units on reforestation, erosion, communicable diseases, improvement of farm homes, water supply, and agricultural problems give many and varied suggestions.

Since no unit can be taught exactly as written, these should be most helpful, for various approaches, activities, and source materials are given.

The bulletin is to be used by teachers and should be of aid in organizing materials.

Louisiana Conservation, (a Collection of Brief Radio Addresses), Louisiana Department of Conservation, New Orleans.

Bulletin No. 25. 1934. 272 p. illus.

In 1933-34 the Young Men's Business Club of New Orleans sponsored a series of radio addresses on conservation and the work of the Conservation Department. These addresses were given, usually, by the chief-of-staff of each division within the department. The topics covered were "New Orleans --Conservation Center of the Southland" in which the speaker emphasized the physical characteristics of the state and city in relation to industries based on natural resources. Other addresses were on fishing, mineral developments, forestry, wildlife, the oyster industry, education, commercial fisheries, sea shrimp industry, and scope, purpose and accomplishments of the Department.

In observance of Conservation Week, 1931, a similar series of radio addresses were made on topics of education, science, sea fisheries, wildlife, salt domes, the oyster industry, forest resources, minerals, and the importance and value of conservation.

These addresses were interesting and educational. They presented the many aspects of conservation and its influence on social and economic conditions. They stressed education of the people of the state. By radio and literature surely many people of the state were reached. Non-technical, they are easily read and understood. The bulletin should be of aid to other states and agencies in planning a program of education in conservation. Schools could use the addresses on the oyster and shrimp industries for they are very complete.

Louisiana Conservation Review, Louisiana Department of Con-

servation, New Orleans. Illus.

This magazine, edited and published by the Louisiana Department of Conservation, is issued quarterly. It contains the reports of the Department. The issues, 50 to 60 pages, are concerned with all phases of conservation--research, educational programs, and industries related to natural resources. Photographs and statistical data are presented in a pleasing and usable manner.

The magazine is furnished free on request to citizens of Louisiana, to public schools, libraries and scientific institutions throughout the United States and foreign countries.

The magazines reflect the trend of affairs in conservation, and the problems met in Louisiana. Surely of great interest and value to Louisiana folk, it is a fine example for other states and conservationists to note.

Michigan Department of Conservation, Its Organization and Functions, Department of Conservation, Lansing. November 1937. 10 p. mimeo.

The Michigan Department of Conservation was organized in 1921 by legislative act. In 1837 mineral resources attracted the attention of statesmen. Fishing protection was recognized as a need in the seventies. Forestry has developed with national forest affairs.

The Department has two direct sources of revenue, (1) Legislative appropriations, and (2) Game Protection fund (licenses).

Divisions of the Department are (1) Forest Fire Control, (2) Law Enforcement, (3) Game, (4) Fisheries, (5) Land, (6) Forestry, (7) State Parks, (8) Geological Survey, (9) Educa-

tion and Public Relations. The function of each division is given.

This is a brief synopsis of Michigan's Department of Conservation--how organized and the work carried out. It could be used by sixth graders as an overview of the workings of a conservation department.

National Defense and Conservation of Resources, Renner, Geo. T. Frontiers of Democracy. March 15, 1941. pp. 182-185, April 15, 1941. pp. 216-217.

After a mere 150 years of national existence, some 85% of our useful wild game is gone, 80% of our timber has been cut, 67% of our visible petroleum reserves used, 67% of our lead and zinc, 51% of our copper, 40% of our iron ore, 35% of our anthracite coal, our fisheries are well over half depleted, 10% of our cultivated land is ruined beyond repair. Yet our business life has been geared to peace rather than war. Our defense program is creating a newer and bigger problem, and will cause us to reach the exhaustion of our natural resources much more speedily.

The solution must obviously be controlled programs of resource conservation. Different kinds of resources call for different kinds of treatment. The total program must include physical planning, and management for some, socio-economic planning for others, and national ownership and socialistic control for still other resources.

Written for adults, this article plainly states what our great war program is costing us in natural resources. There is heedless waste with little or no planning to conserve. It brings to sight the future unless some rather

drastic action is taken.

National Resources Board Report, National Resources Board, December 1934. 455 p. illus. Washington.

This report is the first inventory of our national assets and the problems related. It covers the national planning and public works in relation to national resources, including land use, water, and minerals. The recommendations call for continous planning for (1) Land-use--(a) retirement of submarginal lands at the rate of a million acres yearly for the next 15 years, (b) additions to national and state parks, forests and wildlife refuges, (c) mobilization of national, state, and local efforts to control erosion, (d) debt readjustment, compulsory compensation for improvements made by tenants, (e) range policies--extend Taylor Act, (f) more data on recreational possibilities; (2) Water--(a) permanent Water Planning section, (b) assemble data, make full use of knowledge and experiences, (c) studies of drainage basins as a whole, (d) develop more productive uses of water resources; (3) Minerals--(a) permanent planning agency, (b) legal and economic problems studied, (c) place on a basis of economic stability; (4) Hydroelectric power--it is desirable to provide all sections of the country with electrical power at a low cost, use electrical power as a conservation to save other fuels. A six year budget of construction for public works planning is outlined to care for employment and physical development of our resources. Basic data for planning must include (1) financial balance, (2) population trends, (3) mapping, (4) climatology, (5) water studies, (6) soil and (7) vegetation studies. Regional

problems relating to land and water resources, and detailed committee reports on land, water, and minerals are given.

This report is significant and interesting because it is the first attempt ever made to list just what resources our country has, and what methods can be used for future cooperation. Our country is not as bad off as it might be, but much needs to be done to insure future security and opportunity. The pictures and maps accompanying the report are excellent to supplement the material. Most of the material is too technical for the layman; parts could be used by college students in courses in geography, economics, sociology, and conservation.

National Resources Development Report for 1942, National Resources Planning Board, Washington; House Document No. 560. 1942. 227 p.

The National Resources Planning Board offers a series of recommendations for the transition period and the longer range period of post-war development. These are: (1) transition from War to Peace (demobilization of Armed Forces, war plants and economic control); (2) expanding economy (private enterprise, finance and fiscal policies, physical facilities--transportation modernization, expand electric power, multiple-purpose water resources, land development, pollution control, conservation of soil through Soil Conservation Service; (3) services and security (education, health, nutrition, medical care, employment and social security).

These projects, some of which were planned and in actual production before the war, have suffered from financial and

manpower drains. In order to meet the needs of our democracy plans must be laid now.

This report states some major planning objectives, summarizes planning activities and lines of action to be developed as a post-war program. These are merely recommendations to Congress, but they give the layman an excellent idea of what is being done, and what is planned for the future on the part of our Federal Government.

National Resources Development Report for 1943, Pt. 1 Post-War Plan and Program, National Resources Planning Board, Washington. January 1943. 80 p.

The public works planning includes (1) land development and protection--(a) general economic problems, (b) rural works --soil, water, forest and range conservation, flood control, insects, plant diseases, etc., (c) improvement and expansion of services to rural populations; (2) soil conservation--organized on a project area or on watershed basis; (3) flood control--surveys of entire watershed on basis of run-off, retardation of soil eroding waterflow; (4) irrigation--generalized or over-all area planning and detailed or operational planning, joint investigations by federal, state, and local agencies; (5) forest and park long-range policy--recreation in collaboration with resource studies.

Evaluation of public works for land protection, development, and use is based on technical soundness, benefits to exceed costs, consistent distribution of costs, and harmony with regional planning. Some land may have multiple uses, but each project will have its own particular criteria or objectives. Water plans are based multiple-purpose to combine

various functions in the same structure. Projects for water use and control form a substantial proportion of post-war public works programs.

Recommended projects for 1943 in land development, transportation, power, welfare and health, and the surveys under way are listed. "Shelved" projects which need legislation or further work, but which could be started in a short time are listed.

This is a general overview of the problems which will be before our country immediately after the war, and plans for their solution. Legislation is necessary in nearly all problems. This material is for consideration of the general public and by those charged with direct responsibility for determining our national policies. If our country can move forward as outlined here, all citizens will benefit physically, financially, and morally.

Nation Resources Development Report for 1943, Part 2, National Resources Planning Board; House of Representatives, Document No. 128, Part 2. Washington. 1943. 116 p.

The current planning activities for stabilization and development as outlined review the accomplishments and experiences of the past ten years. This includes wartime planning for resource use (committee reports), trends in production, employment, prices and consumption. Public works planning in nonwar Federal construction have been increasingly curtailed. Most of the flood-control projects were in the investigation stage, and no further work has been done. Reclamation projects in connection with the war program are being continued. Projects to supply essential metals, oil,

power, fuel, food, land, water and timber needs have been pushed. Post-war programs for irrigation, reclamation, forests, parks, range land, wildlife, soil conservation and transportation are such that they can be made ready for early undertaking in the after-war period. The eleven regional field offices have made analyses of the resources. Generalized plans for future land use and public facilities are worked out. Detailed procedures are yet to come. Material has been assembled to indicate suggested post-war distribution of workers in natural resource and manufacturing activities. State planning in California, Arkansas, Massachusetts, and Wisconsin is described. Local planning has included housing, water supply, sewer systems, roads, etc.

This is a complete analysis of how our nation has met the war emergencies by planned effort. Many of these plans can be revised, expanded, and carried over to meet post-war needs. Many ways of improving and strengthening the program are suggested. This report is primarily for consideration of appropriate legislation to achieve normal employment and to provide for further development of our national resources.

National Resources Planning Facts, National Resources Committee, Washington. 1939. 11 p.

The resources of this country were tremendous. They made this the "promised land." The eager rush to reap the rewards of a nation so richly endowed left a tragedy of waste and depletion in its wake. Soil erosion has taken a heavy toll. Our forest area has been reduced one-half. The waste of minerals has been tremendous, especially in the field of oil and

gas.

Theodore Roosevelt, 25 years ago, started the battle to protect our forests, water resources, and wildlife. The need for a planned program to preserve all resources has come into recognition.

Today 45 State Planning Boards have made inventories. Regional planning is shaping (T.V.A.). For the federal government the National Resources Committee makes studies of resources, social, industrial and economic trends and in an advisory capacity recommends programs and policies for conservation and development of land, mineral, water and other resources. The Committee acts as (1) a clearing house, (2) a research and advisory body, (3) a correlator. The Committee recommends to the President and Congress.

This phamplet outlines the functions of the N.R.C. and shows that the nation is becoming increasinly aware of the need for a planned program in regard to our national resources.

This could be used at junior high level in a study of agencies working on the conservation program of our country.

Natural Sciences, (Secondary School Series) Missouri Public School Curriculum, Jefferson City. Bulletin No. 6. 1941. 468 p.

This course of study in natural sciences is designed for use in grades 9, 10, 11 and 12. The units are organized in five sections--(1) general science (air, water, fire, light, electricity, sound, use of power, food supply, etc.); (2) biology (structure and organization of living things, relation of plants and animals to environment, heredity, behavior, reproduction, etc.); (3) physical science (resources, heat

and power, use of water and electricity in power production, science contributions to communication, transportation and health, etc.); (4) chemistry (nature of matter, chemical changes, waters, solutions, etc.); (5) physics (mechanics, heat, sound, light, etc.).

The unit on conservation and natural resources is dealt with in the section on advanced physical science. The suggested content includes kinds of resources, problems of conservation (restoration, management, etc.) of soil, water, forests, wildlife, minerals. In this, and all the units, suggestions are given for field trips, experiments, collections, surveys, etc. Much use is made of environment situations in Missouri.

The bibliography is full and up-to-date. Visual aids and sources of material are excellent.

The units are well organized to take care of individual differences and interests. They are very suggestive and should be valuable in any secondary school.

Nature Projects for 4-H Clubs, Brooks, A. B. United States Department of Agriculture, Co-operative Extension Work in Agriculture and Home Economics, Wheeling, West Virginia; Oglesbay Park Pub. No. 4. Undated. 37 p. illus.

In this work-book the projects covered are birds (building of houses, feeders, collecting nests, field study, identifying birds, coloring pictures, photographing), insects (collection and preserving, life histories), trees (leaf collections, field study), flowers (flower presses, gardens, terrarium, identifying flowers).

The use of this work-book is diversified so that some

projects could be completed by fourth or fifth graders, as well as junior high students. Much helpful information is given and the projects are interesting. Parts may be adapted to various uses and needs.

Nineteenth Annual Report of the Department of Conservation, State of Indiana, for the year ending June 30, 1937; Reprinted from 1937 Year Book; Indianapolis. pp. 801-885.

Today conservation of natural resources has become one of the most important functions of the state's government. At no time in Indiana's history has there been greater public interest in the importance of natural resources and a more sincere desire for wise utilization of these resources.

This report tells of the activities of each division of the Department of Conservation. Namely: (1) State Parks and Lands and Waters (improved camping facilities, new cabins built, roads repaired, new lakes opened, etc.); (2) Entomology (fight against Japanese beetle, European corn borer, apiary inspection); (3) Geology (enforced laws pertaining to production of petroleum and natural gas, inspected well and pipe line equipment, collected data, investigated dam sites, aided in compilation of topographic maps, etc.); (4) Engineering (drainage, land reclamation, stream gauging, inspected roads, bridges, drafts for various projects); (5) Forestry (inspection of classified land, operation of nurseries, reforestation of lands, educational talks, experimental research, fire hazards, etc.); (6) Fish and Game (expansion of game farms and hatcheries, fish rescue, opened lakes, research, etc.); (7) Educational Bureau (furnished material for many people and groups, motion pictures made available, radio

broadcasts given each week, wildlife exhibit truck displayed at 23 different locations, published (Outdoor Indiana," etc.).

This is a detailed account of the work of the divisions of the Conservation Department of Indiana. Of interest to those concerned with conservation programs, it gives a complete picture of Indiana's work and achievements. It contains much statistical data which is of little meaning to the average reader.

Opportunities for the Preparation of Teachers in Conservation Education, United States Office of Education, Washington. Phamplet No. 90. 1940. 13 p.

Courses concerned with the conservation of our natural resources and designed for teachers in the elementary and secondary schools are available in at least 138 institutions of higher learning in 35 different states. In ten states, courses in conservation are offered in all the State-supported teacher-education institutions.

In its varied ramifications conservation involves technical knowledges which as yet are not adequately translated into the language of the school. However, there is general agreement that the ultimate success of any nation-wide program in conservation depends upon organized education. School officials are seeking authoritative guidance on two significant aspects--one concerned with content material; the other with school and class-room procedures.

This phamplet is designed primarily to help teachers. It is a result of a catalogue study. A list of the institutions offering courses in conservation, titles of these courses, credits given and a brief description of a few representative

courses consititute the information in this phamplet.

Our Economic World, Kinsman, Delos O. Thomas Crowell Company, New York City. 1937. 584 p. illus.

Man is the central animated factor in our economic system. His wants have given content and direction to productive enterprise as truly as his labor has given form to the output. To comprehend our industrial world we must have a knowledge of human wants. Man's wants are four fold --physical, intellectual, spiritual, and social.

Of the total supply of natural elements constituting the earth, man has learned to use but few. The term natural resources is applied to those materials and forces of nature which man employs industrially. To give them the composition and form necessary to make them usable, the extractive and manufacturing systems arose; to move the finished product, transportation developed; to deliver goods to customers became the work of merchants.

The resources discussed are (1) plants as a source of food, (2) animals, (3) textile fibers, (4) forests, (5) minerals (non-metallic and metallic); (6) energy resources. Each of these is described as to importance, distribution, uses and economic trends.

This text is an excellent study of the world's supply of raw materials, the intricate processes of production, and the economic system which makes available our vast supply of goods. The historical approach makes clearer man's mastery of industrial difficulties. A text on college level, it could be used in economics, and as supplementary material in geography, conservation, or a study of business. No emphasis is placed

on conserving these raw materials.

Our Natural Resources and Their Conservation, Perkins, A. E. and Whitaker, J. R. John Wiley & Sons, Inc. New York City. 1939. 645 p. illus.

Conservation seeks to insure to society the maximum benefits from the use of our natural resources. The objectives vary with the nature of the resource and uses being made of them. A discussion of the conservation movement in America takes up the early appreciation of wise use, growth of the movement during T. Roosevelt's time, and present day problems and efforts to meet them. The remainder of the book is concerned with our natural resources. Emphasis is placed on the distribution of each resource, the problems of waste, wise utilization, and the human factors involved. One section is devoted to planning and its advantages.

Each chapter is written by a different person (a total of 22 authors), an expert in his particular field. Though this does cause duplication, the material is authentic and, in every instance, well written in a clear, concise style. Pictures, maps, graphs, etc. aid in the understanding of the discussions. The selected bibliography for each chapter is excellent.

This is one of the best and most complete works on our natural resources and the problems confronting the people of America relating to these resources. Some measures have been and are being taken, and others are suggested. The facts concerning our resources are plainly set forth; their distribution, their utilization in the past, and the probable future is considered fully.

As a text for college students, this book is one of the best. Every phase of our natural resources and their conservation is covered. Many parts could well be used in relation to geography courses also.

Outdoor Living, Cornell Rural School Leaflet, New York State College of Agriculture, Cornell University, Ithaca. Vol. 34, No. 4. March 1941. 31 p. illus.

This leaflet gives ideas for hiking and camping. It describes how to make cooking equipment from tin cans, suggests ways of cooking, plans for a well-balanced variety of wholesome food, ways of purifying water, putting up tents and building lean-tos, making of beds of brush, etc. on overnight trips, and general care of a camp site. The use of a compass is described, as well as getting bearings from stars, and the marking of trails.

Dangerous or annoying animals such as mosquitos, chiggers, ants, bees, etc. are combatted by various means--citronella, powdered sulphur, etc. Treatment for poison ivy, poisonous roots, fungi, etc. is given.

Ways of having fun by watching birds and game are building blinds to watch from,painting grasshoppers and watch how far they travel, identifying trees, leaves, etc.

This leaflet would hold great interest for any child who has ever hiked or camped. The illustrations are excellent and very worthwhile. Nature leaders, scout leaders, and adults would learn much from the use of the publication.

Outdoor Nebraska, Nebraska Game, Forestation and Parks Commission, Lincoln. Illus.

This magazine, published quarterly, contains timely and interesting articles concerning activities of the game, forests and parks program in the state of Nebraska.

It is important to keep the public informed with regard to conservation programs and activities. This magazine serves that purpose; however, there is a possibility that it caters more to hunting, fishing and trapping activities than to other phases.

Planning for America, Galloway, Geo. B. and Associates, Henry Holt & Company, New York City. 1941. pp. 89-168, 362-448.

Planning is an organized effort to utilize social intelligence in the determination of national policies. It is based on fundamental facts and various factors of the past, present and future. Physical planning is concerned with conservation and use of our natural resources: our land, water, energy, science and technological resources. The United States has organized a large and complex tool for national planning. There are a variety of approaches to regional studies of land-use; high technical skill will be needed to solve the problems of price, production and ownership controls in farm and forest use. Water planning principles needed are broad control of the requirements of drainage regions, emphasis on multiple-use projects, and complete integrated surveys and plans in the field. In planning for our energy resources great need lies in the prevention of waste in fuel resources, long-time trends in the utilization of energy resources, and research in supplies of water power and low-rank coal. Social planning to insure nutrition and

health programs which are adequate involves research and education and certain economic arrangements. Such planning involves both individual action and social organization.

This symposium, each chapter written by an expert, is an inquiry into the social and economic planning of the United States--physical, social, economic, area, and defense. It is well written in a scholarly style but is difficult to understand unless one has a rich and varied background in certain trends.

It could be used as a text in advanced social science, economics, and conservation courses at a college level.

Planning for Permanent Benefits from the Land, (A Unit), Department of Public Instruction, Salem, Oregon. 1939. 31 p.

In this unit, consideration is given to the conservation of resources particularly as it applies to Oregon and the Pacific Northwest. The resources are divided into two groups --renewable resources or products of the soil, and non-renewable such as coal, iron, and petroleum. The renewable resources are far more important to Oregon than are the non-renewable.

The content of the unit covers the forests, fish, game, wildlife, soil, and to some extent, minerals. The activities suggested are varied and worthwhile. The bibliography is very full and up-to-date. Throughout the unit emphasis is placed on the practical aspects of conservation.

This unit, for use in the 10th grade, should be very suggestive to teachers in high schools in developing units on conservation.

Plants and Animals Live Together, My Land and Your Land Conservation Series, Book 3, National Wildlife Federation, Inc. Washington. 1941. 48 p. illus.

Every plant and animal depends in some way upon other plants and animals. Man depends on all of them. Animals help plants by eating insects and by spreading their seeds. Plants help animals by providing food and homes. The coming of man changed conditions. Forests were cut and burned causing many animals to leave or be killed, and many places were left where topsoil was washed away. Grasslands have been changed to plowed fields. Many animals perished because their homes were destroyed. The plowed soil is easily carried away by water or wind. Streams were polluted by sewage and other wastes, thus destroying water animals.

Provisions being made by our government to protect our wildlife are (1) national parks, (2) national forests, (3) game and fish hatcheries, (4) laws, and (5) refuges.

Written for grades five, six, and seven, this little booklet is interesting and simply worded. It would be useful as a supplementary reader in certain phases of study. The accounts are not detailed, but give reliable, general information.

Poisonous Plants of Wyoming, University of Wyoming, Agricultural Experiment Station, Laramie. Bulletin No. 126. March 1921. 35 p. illus.

Poisonous plants, while confined to certain areas of Wyoming, are nevertheless responsible for losses of considerable magnitude among stockmen. There is considerable variation from year to year; many deaths are difficult to diagnose.

During the past few years there has been a very creditable advance made by stockmen in attempting to get acquainted with the troublesome weeds.

Contributing factors incidental to plant poisoning are numerous. Ordinarily, plants are protected from animals through various sources (odor, acrid or bitter taste, spines, etc.). The depraved appetite for unusual and unappetizing plants is a factor of importance. The susceptibility of different species of livestock is a factor of considerable importance.

The principal poisonous plants of more or less general distribution may be classified into two groups: (1) those that occur rather generally and in large quantities over the state(loco, larkspurs, death camas, water hemlock, the lupines, arrow grass); (2) those found locally and in more restricted areas. These are described as to distribution, animals affected, poisonous period, symptoms, treatment. Unfortunately, prevention cannot be obtained by vaccination. Controlled methods of grazing are the only preventitive measures given.

This phamplet discusses some of the various factors involved in cattle losses from poisonous plants. For the stockman, it gives some ideas for meeting the problem.

Poverty or Conservation? Darling, Jay N. National Wildlife Federation Bulletin Vol. 4, No. 1. Washington. January 1939. pp. 2-8.

We have, as a nation, specialized on exploitation. Conservation is the reverse of exploitation. The fundamental aspects of conservation have been, and still are, a blind spot

in our social, economic, and political vision. The history of civilization is largely made up of the rise and fall of empires through the exhaustion of resources. Conservation is the job of so managing our soils, waters, and gifts of nature that man's search for these necessities shall not be in vain. America is no richer than her remaining resources. Wealth will continue to exist on this continent only so long as the natural resources of our soil and water continue to yield up their riches in proportion to the requirements of our population. When these resources are further depleted prosperity standards of living and social contentment among our people will vanish. To illustrate these statements, examples such as the salmon industry, the Dust Bowl, ghost towns, etc. are cited. The National Wildlife Federation seeks to weld into a national front all the various local clubs, and individuals who are interested in conservation, and then provide a means of mass protest against exploitation.

This address was given by the President of the Federation. It is timely and interesting. It could well be used on a senior high level to aid in understanding the social, economic, and political aspects of conservation.

"Poverty or Conservation Your National Problem," Darling, J. N. National Wildlife Federation; Washington. Undated. 30 p.

Warnings to this nation that the depletion of our natural resources has already reached the danger point are just as plainly written across the face of this continent as were the threats made by Hitler, Mussolini, and Hirohito. These warnings are written in million-acre patches of denuded forests, abandoned farms, dust bowls, and dried-up rivers,

springs, and lakes. Forty billion dollars have been spent but the major problem of checking the disease of dwindling resources has scarcely been touched. The war put upon our resources the greatest burden ever known. We will win the war against our foreign enemies, but if we do not defend our resources we will lose a battle from which this continent will never recover. If we begin now the intelligent application of principles which would have prevented past waste, we can at least insure continuity of use of what we have left. America is no richer than her remaining resources. Most of our conservation activities have been badly overrated. Education is the only real road to success--the laws of nature must be observed or dire consequences will occur from their violations.

This timely and pertinent information relates the effects of war on our natural resources and consequential effects on the social and economic future of America. The failure of our education institutions in teaching conservation to teachers is largely blamed for the ignorance of our people as to the present state of affairs. Certainly this is a challenge to educators.

Well written, in simple straight-forward language, this information is for the average layman, and certainly for educators.

Price List of Aids, The Wild Flower Preservation Society, Inc. Washington. Undated. 4 p.

This list of aids is designed for teachers and leaders or sponsors of clubs and organizations interested in conservation of wild flowers. Bulletins on state flowers range from

35¢-50¢. Circulars are usually 5¢. Wildflower color plates vary in price. Flower posters range from $1.00 to $7.00 per 100. Visual equipment (lantern slides, photographs, motion pictures) is available either on rental or retail basis.

This list is a very complete price list of material available from this Society. Much of the material is nominal in price, and teachers could use it.

Problems or Issues in Teacher Education in Arkansas, Curriculum Labratory, College of Education, University of Arkansas, Fayetteville. Bulletin No. 3. 1941. 46 p. mimeo.

The State Legislature passed an act requiring the teaching of nature study and conservation in all public schools of the state. In order to prepare prospective teachers to do such teaching, a teacher education seminar was conducted to investigate and plan a college program to fill the need. It was agreed that the general objective of conservation education was to be the development of wholesome attitudes toward civic responsibilities through an understanding of the value of natural resources to our economic and social orders. Specific objectives were concerned with subject matters. On a college level, the prospective teacher should engage in experiences which his pupils will experience--organization of materials, excursions, planning units, collecting specimens, etc. Some problems or units are suggested wherein these experiences may be met. No specific units, techniques, or procedures are included due to the limited time of the seminar. The bibliography and visual aids are very full.

This bulletin is a guide to college faculties in initiating a program for pre-service teacher trainee education in

conservation. The organization of material for content is weak, due, I believe to the limited time and the fact that such a program was just beginning. It does give in insight to the problems which have to be met.

Publications, Michigan Department of Conservation, Division of Education, Lansing. 1936-37. 8 p.

Listed are 106 publications issued by the Michigan Department of Conservation. A few are now out of print. Some are annotated. The topics covered are fish, game, state parks, forests and lands, forest fires, laws and enforcement, geology, and general conservation in Michigan.

This list should be helpful to teachers in gathering source material and students doing research work. The publications are on a senior high or college level.

Regional Factors in National Planning, National Resources Committee, Washington. December 1935. 223 p. illus.

The consideration of what is called regional problems is thrust upon the attention of our Nation by a number of urgent situations; among them are the increasingly clear realization of the inadequacy of single States to carry out all planning programs necessary for conserving our natural resources, development of interstate cooperations movements, rise of two-group-of State planning regions, creation of the T.V.A. and others. To meet problems of regional organizations involving more than one State, the recommendations are (1) State planning, (2) establishment of regional planning commissions, (3) encourage interstate compacts, (4) use of Federal Corporate Authorities, (5) Federal Administrative

regional centralization (10 or 12) centers. Jurisdiction is one of the most important problems of governmental administration. The natural resource problems are directly related to regions. Many programs on a State basis exhibit inadequacies as evidenced in land-use and water. Interstate compacts are limited for continuous and progressive planning. Federal departmental procedures use regions as a device for decentralization rather than for isolating characteristics and problems of areas. The T.V.A. is the only example of a federally created regional authority. Geographic factors implicit in regionalism are (1) continuous and compact territory, (2) maximum homogeneity, (3) unity and organic interrelationship, (4) economic--natural unity, (5) total areal pattern of culture, (6) regional identity, and (7) fairly large size. Regional factors importantly affect such enterprises as waterways, power, irrigation, forestry, erosion control, etc.

This report discusses problems of planning and development which overlap State lines and which require the use of combined Federal and State powers. It recognized "State rights" as a big problem to be ironed out. It is a basic consideration to be consulted before regional planning areas are designated and offices and plans made. To be used primarily for Congressional study and action, it contains much for students of geography, economics, sociology, conservation and law.

Regional Planning, Part 1 - Pacific Northwest, National Resources Committee, Washington. May 1936. 192 p. illus.

The Pacific Northwest region (Idaho, Montana, Oregon, and Washington) is primarily devoted to the production of raw materials. Manufacturing plays a minor part. This region contains 55% of the entire virgin timber within the national boundary and maintenance of the timber industry is of critical importance. Private ownership controls the largest proportion of accessible saw-timber; few private operators work on the principle of sustained yield. The importance of the water resources is due primarily to needs of navigation, irrigation and hydroelectric development. The total developed and potential water power resources are estimated to be sufficient to generate over 15½ million killowatts of firm power available 90% of the time. A wise national policy will see to it that this resource is so distributed as to achieve the maximum regional and national benefits. The Columbia River is unique in creating an ideal situation for the development of a series of great power sites. "General plans" locate 10 great dams. Grand Coulee and Bonneville are already begun. Climatology, water, land, minerals, recreation, industry and transportation of the region are discussed. Interregional problems are numerous. Forces working against regional cohesion are the economies based on competition between cities, and the attitude of irrigationists toward one another.

This report gives a clear picture of the Pacific Northwest--its physical features, its resources, and the immediate and urgent problems in the Columbia Basin. Graphs, maps, and charts supplement the material. The presentation is not technical, and, though intended for legislative action, would be interesting to adults for its history, geography, and con-

servation.

Regional Planning, Part 2 - St. Louis Region, National Resources Co mittee, Washington. June 1936. 68 p. illus.

The cities of St. Louis and East St. Louis presented urgent problems in traffic, housing, recreation, and similar organized fields of social planning activities. Adjoining counties into which the central city was expanding faced special problems. The region extends 35 miles from the central business district and is roughly 5,200 sq. mi. in area. The survey considered distribution and density of the future population, and the character of physical improvements needed. Recent trends show that the population is moving from the outer portions of the region to suburban towns in the metropolitan district. The older residential areas have been losing population. Of the total future population, 94% is expected to be located within the metropolitan area. Physical improvements existing and proposed include highways, bridges, elimination of dangerous grade-crossings, airport and transit facilities, sewers, etc. Federal and interstate problems are connected with river navigation, port development and river crossings, flood control, dams, and public health.

The problems of a metropolitan region are different from those of other regions, but they are no less important. Probable future trends and needs of this metropolitan region are outlined and plans to meet these needs are being developed. It is interesting to note the various factors influencing future trends, and the ways in which large cities change. This material is primarily for the guidance of legislative activities,

but parts could be used in a study of the community by junior high school students, or civic clubs and other such groups.

Regional Planning, Part 3 - New England, National Resources Committee, Washington. July 1936. 99 p. illus.

The major features of the regional plan for New England include: (1) a plan for a coordinated transportation system; (2) a plan for the conservation and development of interstate water resources; (3) a plan for the preservation of outstanding scenic and historical sites, and development for interstate recreational areas. About three-fourths of the people live under urban conditions; the population is primarily industrial. Agricultural problems are market competition, abandoned land and erosion. Forestry problems are those of tax delinquency, depreciation of land values, cut-over and submarginal lands. Recreation problems are inter-relationship between public and private enterprises, public land acquisition, facilities and access to recreation areas. Water resources have provided industrial electric power, navigation, and other benefits. Problems are water supply, power, pollution and flood control. Industries such as fisheries, non-metallic minerals and manufacturing are essential. The program calls for a study of conditions and promotion of industrial readjustment and expansion.

This survey of New England's resources and the problems related to them is interestingly presented. The material reflects the awareness of the need for a planned program, and takes into consideration the separate State plans and their coordination into a complete pattern for the region. Parts

of the historical and geographical data could be used in a community study by junior high school students. The maps, pictures and graphs are excellent supplements to the written material.

Regional Planning, Part 4 - Baltimore-Washington-Annapolis Area, Maryland State Planning Commission, Baltimore, Maryland. November 1937. 65 p. illus.

The Baltimore-Washington-Annapolis area needs a planned program to guide the growth of suburbs, land use in the rural areas, and the expansion of transportation and public utilities. Recommendations are (1) Farming--(a) Piedmont Section-regulation of suburban growth and preservation of open spaces, (b) Coastal Plain-purchase of eroded land for public use; (2) Suburban growth--regulation by zoning, etc.; (3) Forests and Parks--acquire at least 100,000 acres; (4) Reservations and Institutions--preservation of taxable semi-public open spaces; (5) Motorways--construction of two major highways and necessary connections.

This beautifully illustrated report on the needs of the B.W.A. area is interesting and well written. It is intended to introduce the public to the problems of the area, and to stimulate interest. If it received wide circulation, it would fulfill its purpose. The primary problem is one of suburban growth and expansion. This report covers this problem completely. It could be well used by sixth graders in a study of the area; it should interest residents of the area.

Regional Planning, Part 7 - Alaska--Its Resources and Developments, National Resources Committee, Washington. December

1937. 213 p. illus.

Special problems in the development of Alaska are (1) fluctuations of industry, (2) the native population, (3) natural resource laws and leases, (4) administrative agencies, and (5) insufficient public services. Alaska is important because of industries based on renewable resources such as timber, fish, or wildlife rather than because of its agricultural position. Two development policies are possible: (1) as a source of raw material for the United States (would leave a gutted land a few generations hence) or (2) to give it an independent and well-rounded economy as the physical conditions will permit. Alaska needs (1) a comprehensive survey and investigation, (2) basic general plan of development upon which superimposed detailed plans for each region are used, (3) a transportation system, (4) other investigations (fisheries, mining, etc.). Staff reports are given on Alaska's (1) population, (2) meteorology and climatology, (3) aquatic resources, (4) minerals, (5) wildlife, (6) forests, (7) water, (8) agriculture, (9) recreation, (10) transportation, (11) communication, and (12) national defense.

This is an interesting survey of Alaska--its problems, some of its resources, and the great need for further study and development. In non-technical language, the material is well written for interested citizens, and could be used to advantage with social studies and conservation classes at high school level.

Report of the Committee on Social and Economic Conditions in Alabama and their Implications for Education, State Department of Education, Division of Instruction, Montgomery. Curriculum

Bulletin No. 3. 1937. pp. 98-139.

The South excels in its superabundance of natural and human resources and lags in the measure of its technological wealth, its artificial wealth, its industries, and its modes of life and culture. Alabama is typical. Her use of and profit from her rich resources is meager. Her lag in technological development is evidenced by poor machinery, low-grade skills of workers, inefficient industries, and lack of education in technical lines. Dust storms and water have eroded 3,000,000 acres of her lands. Agencies working on this major problem are the Alabama Agricultural Extension Service and the Soil Conservation Service. Two-thirds of Alabama is forest land. Fire, unwise management, waste, and poor marketing conditions are obstacles to be overcome. Efforts to conserve wildlife include game refuges, state owned land, hatcheries, etc. Mineral resources include coal, iron ore, asphalt rock, building clay, etc. These mean new wealth if they are intelligently and economically exploited. Technological development of water resources is imperative to balance the wealth of this resource and the comparative poverty of the population.

Alabama is part of the "population reservoir" of the nation. Child welfare activities are well begun. Rehabilitation of the physically handicapped, aged, and other phases of welfare lag.

Utilization of human resources is a basic problem for education. The average educational attainment in Alabama is sixth grade; low level of efficiency of industrial and rural workers is evident; malaria and hookworm affect thousands; other factors also give evidence that curriculum adaptation,

vocational guidance, and recognition of human needs within the state are needed.

This report deals at great length on the regional deficiences of the Southeast, and Alabama in particular. The great lag in all phases of social and economical aspects is apparent. The excellencies of the South are attributed for the most part to nature. Where man shapes his own environment the picture is less rosy. For all educators and people interested in the future of the South, this bulletin gives a vivid picture of the conditions there.

Report of the Department of Conservation, June 1940, Tennessee Department of Conservation, Nashville. 1940. 48 p.

The divisions of the Department and their activities for the year ending June 1940 were: (1) Game and Fish--purchase of 185 deer, and release of 1,000 turkeys, 18,000 quail, 2,400 chukar partridges, operation of four game preserves, cooperated with TVA, raised and distributed 110,000 bass and 100,000 trout, improved hatcheries, educational projects with 4-H Clubs, schools, and teachers. (2) Forestry--fire control (four look-out towers, telephone lines, etc.), increased nursery areas, supplied six million seedlings, maintained leased and owned forests, cooperated with United States Forestry Service, Soil Conservation Service, etc. (3) Geology--located 23 new deposits of manganese, reports on phosphate deposits, series of market circulars on minerals issued, mapped areas outside of TVA, etc. (4) State Information--recreational and scenic booklets and maps issued, advertisements in newspapers and magazines, maintained contacts with travel bureaus, auto clubs, etc. (5) Hotel and Restaurant

Inspection. (6) Educational Service--worked with teachers, furnished seedlings for school planting, showed movies, published reader and workbook "Birds of Tennessee in Verse and Song," and made three movies, held meetings with civic clubs, and organized seven sportsmen's clubs.

This publication gives a clear picture of the program carried out by the Conservation Department. In each division, education is a very important phase of the work. It is of interest to citizens of Tennessee and to teachers as a source material.

Resources for Victory, Orchard, John E. Columbia University Press. New York. 1942. Columbia Home Front Warbooks No. 4. 36 p.

We are greatly tempted to say that our resources and their utilization will insure victory. We are a rich nation endowed with forests, water power, minerals, soils and other natural wealth. With the change from peace to war has come a change from abundance to scarcity. With all our variety of resources we have never been self-sufficient. We have imported many things--tin, rubber, tung oil, tungsten, nickel, vegetable oil, silk, hemp, tea, coffee, etc. It has become increasingly difficult to obtain these materials. We have accumulated some stock piles but these are not adequate to meet our needs. Increasing output by speeding up production is limited. Development of substitutes is a long process. Our most important hope is to divert our resources from civilian consumption to war use. Our resources, in comparison with the position of the Axis Powers, which are discussed are steel, ferroalloys, aluminum, tin, copper, petroleum, crude

rubber, raw silk and food supplies. In the review of these resources emphasis has been put on the uneven distribution resource position of Germany and Japan. Germany has steel, aluminum, machine tools and scientific knowledge; Japan has rubber, tin and fats. A divided stand makes a less formidable combination.

This phamplet interestingly describes why there are shortages in civilian and war use. It explains why civilians must do without in order to out-produce the Axis. A timely topic, it is readable and easily understood by the average layman.

Roads to a New America, Doyle, David C. Little, Brown and Company, Boston. 1938. pp. 3-115.

Part one of this book is a picture of a nation liquidating its assets--its natural resources. Our early ancestors did little damage but on expansion to the West, American life was keyed to the march of new pioneers taking possession of vast and seemingly endless riches. With the coming of technology demands increased and bigger and better machinery cut inroads in our supply. In a survey of our resources, soil conservation is one of the things we are doing best in the United States. Since the organization of the Soil Conservation Service in 1934 much has been done. Our country is rich in minerals and also the instruments and techniques for using up our supplies. Our forest industry is geared to quick liquidation. The Forest Service is working to bring our forests to a balance between growth and depletion. Civilization has upset the balance of nature and to combat the resulting pests a program of wildlife restoration fits into the picture of a nation adjusting itself

to its resources, and trying to make them work together for our benefit. The people of America are our most important resource. We should look to their health, morale, and training. In order to meet the needs in relation to our natural resources the author believes there should be closer co-operation between public authorities and private owners, government control in some instances, public services lifted above politics, subsidies to states, and greater investments on the part of the government. The remainder of the book deals with technology, our economic systems and government practices.

This discussion of America's many problems offers practical suggestions for their solution. In spite of our many mistakes the author is cheerful in his outlook. For the adult reader the book is a challenging survey of business problems in a democracy.

Should We Have National Textbooks on Conservation Teaching? Quaintance, Chas. W. School Science and Mathematics. October 1938. pp. 789-795.

Surplus derived from the sale of wildlife poster stamps during National Wildlife Restoration Week, said "Ding" Darling, should be used for national textbooks on conservation. But, would national textbooks be advisable? Local conditions differ. A textbook written for one state or area would not be adequate for others. The diverse regions of our United States have many major resources; any textbook to cover these would be enormous.

An investigation of state tentative programs was carried out. Some gave evidence that the material being given to teachers has a tendency to indoctrinate current practices rather than clear critical thinking. The study of things at hand should

be stressed. Furthermore, building on personal experiences with local resources, the child can create a philosophy of conservation for his own community. A textbook describing general principles and problems cannot have the effect that actual contact will have. Mature students should be conversant on problems of broad scope, but this knowledge must have a basis laid on a study of familiar resources in the immediate environment.

This article clearly recognizes the definite lack of textbooks on conservation. The advisability of national textbooks is questioned. This article would be of value to teachers and curriculum planners.

Social Studies, (Secondary School Series), Missouri Public School Curriculum, Bulletin 4A. 1941. pp. 97-108; 391-397; 451-470. Jefferson City.

This is a course of study designed for use in social studies with grades 9,10, 11 and 12. In the section on personal and community problems Unit V deals with the citizen's opportunities and obligations in relation to his physical environment. The scope of the unit covers the resources of Missouri and the problems involved in their use and conservation. In the section on contemporary American problems, Unit V is concerned with conserving human resources as a social problem. The scope of this unit covers the worker (health, safety, happiness, competition with machines, training) and employment problems. In economic problems, Unit IV and V are concerned with phases of conservation of soil, forests, water, minerals, wildlife, and their influence on man's way of living. The agencies working toward conservation of our

resources are included in the unit. The unit on agriculatural problems some what overlaps, but is considered so vital that it is included.

For each unit an extensive bibliography of books, phamplets, magazines and government publications is given. Visual aids are listed for some units. The suggested activities are varied and worthwhile. These units are based on community problems characteristic of Missouri and should be most helpful to teachers.

Teaching Conservation in Elementary Schools, Bathurst, Effie G. United States Office of Education. Washington. 1940. 125 p. (Bulletin 1938, No. 14)

This bulletin deals with the organization of material concerning conservation and ways of teaching. Conservation education cannot be confined to any one subject nor limited to a single unit. Any plan or outline of content should be flexible enough to allow adjustments to needs of classes and unforeseen interests. The organization of material should afford opportunities for the integration of instruction with normal activities of life, and activities of different grades should be coordinated with respect to the interests of the entire group. Each school must plan its own type program. Given is a suggestive outline for use in developing units on conservation of soil. It is divided into primary, intermediate, and advanced material to be used in either urban or rural communities.

The activities given may be used to advantage by teachers developing units on soil and land use. The organization of the material is somewhat weak but parts can be used. The annotated

bibliography for teachers and pupils is excellent.

This bulletin would probably be most useful to a committee on curriculum development.

Teaching Conservation in Wisconsin School, Wisconsin Department of Public Instruction, Madison. Curriculum Bulletin Vol. 1, No. 1. May 1937. 68 p. illus.

Conservation seeks to maintain the supply and quality of our natural resources. Conservation is one of the major ways in which thoughtful, public-minded people are seeking the common good. We have groups of interested individuals who are endeavoring to arouse the public to some understanding of the factors involved in the conservation of our resources. We have tried regulation. Now society has turned to the school.

In the preschool years the child may be taught to respect the rights of others, and to have a feeling for the beauty of nature. In the elementary years conservation attitudes and appreciations may be much extended and strengthened by nature study. In the early secondary years some basic principles may be grasped; in later years these will be extended to include the social and economic aspects.

In Wisconsin schools the resources considered are soil, water, minerals, forests, wildlife, and scenic and historic sites. An outline of content is given for each resource; the bibliography is short. Each teacher would necessarily select material for her own needs. No procedures are given, but as a guide for subject material this material is excellent.

Tentative, Suggestive Outline for the Study of Washington--

Its History, Government, Industries and Resources, Washington Department of Public Instruction, Olympia. September 1941. 28 p.

This unit is to be used in the intermediate grades and much opportunity is evident for a study of conservation problems in relation to industries (lumbering and forestry, farming, fishing, etc.) and in a study of scenic and historic sites of the state. The activities are not particularly numerous and very few books or other informational material is given. However, the outline of content material is well organized. It could be used by teachers of the state of Washington.

Tentative, Suggestive Outline for the Study of Washington--Its History, Government, Industries, and Resources, Washington Department of Public Instruction. Olympia. September 1941. 59 p.

In this bulletin two units are developed on conservation --one on the lumber industry of Everett (mills and mill products), and the other on the industries and resources of the State of Washington and the Pacific Northwest.

In these two units, on the ninth grade level, the outline of content is well organized; the bibliography is excellent; slides and film strips are listed; the suggestions on procedures are full. This is excellent as a guide for constructing units to fill particular needs and abilities.

The Advance of Conservation, Emergency Conservation Committee (Report for 1937), New York City. Pub. No. 70. 1937. 12 p.

Described in this report are the efforts put forth for

the saving of the Yosemite Sugar Pines, the campaign for the Olymphic Forests, the operation of Hawk Mountain Sanctuary (film made), demands for a closed season on waterfowl, protests against Pennsylvania's bounty of $2.00 on the Great Horned Owl, and the publications of the Committee (units on Owls and Hawks, at high school and college level).

This report serves to inform the public of the activities under way. The interests of the Committee are widespread, and where campaigns are feasible, it sends representatives to plead the cause.

The Conservation of Natural Resources, (Digest of Subcommittee Report). Department of Education, Committee on Curriculum Revision. Baltimore. 1940. (Report No. 7) 222 p.

This bulletin is a preliminary study which considers the essential facts of the problem of conservation as it affects such topics as soil, waterways, forests, wild animals, minerals, health, state and national planning. This study will be the basis for formulating and revising courses of study (in Maryland) to meet current social and economic needs.

The topics covered as to causes, control, agencies, and economic effects are soil erosion, farm lands, water resources, forests, wildlife, minerals, human resources, and national, state and local planning. With each topic are listed the educational implications which will be the guiding principles underlying the building of courses of study. In view of the fact that a variety of subject matter is already offered in the curriculum, it is considered advisable to emphasize conservation wherever possible in the existing courses of study in social study, English, and Science. Illustrations

of such emphasis are described in civics, geography, general science, biology and economic civics.

This bulletin would be of valuable aid to groups revising courses of study and as a guide to individual teachers in organizing units and projects concerned with any phase of conservation. Parts may be used with fifth or sixth grade groups as source material for oral reports and the like.

The bibliography for each topic is excellent for teacher use.

The Economy of Abundance, Chase, Stuart. The Macmillan Company. New York City. 1934. 322 p.

The Economy of Abundance means an economic condition where an abundance of material goods can be produced for the entire population of a given community. Our conditioning has been in terms of scarcity with emphasis on the vendibility of goods rather than serviceability. Scientific methods laid the foundation for the economy of abundance which appeared late in the machine age. Such a condition functions only when industrial units operate at capacity. Capitalism functions on a vendibility basis. Monopoly, protective tariffs, loading of distribution costs, suppression of invention and other means are used to maintain a spurious scarcity. The economy of abundance is undermining the efforts of bankers and manufacturers to preserve the scarcity values of their commodities. In spite of the great increase in energy output there has been no corresponding increase in the material well-being of our population. Food, clothing, shelter, education, health, and recreation are still within the province of vendibility, and problems of economic insecurity facing the

farmer, mechanic, day laborer, clerk, etc. are identical. Our country has great wealth in natural resources, power, and energy, but not in terms of human use and enjoyment.

This inventory of our resources of energy, services, and goods shows the advance in wellbeing that might be obtained if these resources were permitted to be used in our behalf. Drastic changes in our economic system would be necessary, but no mention of how to make the change nor the final goal to be attained is given.

For the layman and college student this book presents factual material in a picturesque and interesting form.

The Structure of the American Economy, Part 1 Basic Characteristics. National Resources Committee. Washington. June 1939. pp. 42-59.

The major basic elements in the structure of economy are the wants of the consumer and the resources of the country. Concrete resources are the natural resources and the plant developed by man (homes, factories, etc.). These natural and man-made improvements provide the physical resources available for further production and contribute to the structure of American economy, particularly the geographical characteristics. Other resources which condition production are climate and topography, techniques of production and social institutions. The United States is rich in natural resources; we are essentially independent of foreign resources. The productive plant is well constructed and flexible. The physical environment is extremely favorable for production. Our technology is modern and effective. We have a complex of social institutions which binds the whole population into a

functioning economy. It is not for lack of consumable resources that consumer wants are not more fully and extensively satisfied. Faulty organization of production is the cause.

The geographical structure of American economy reflects three factors: location of resources, location of consumers, and the historical process by which economic activity has been carried on in the past. Industries located close to resources are agriculture, fishing, mining, and certain manufacturing processes. Industries related to services, retail trade and construction are located close to consumers. Relatively footloose activities are those of the wholesale trade and certain other manufacturing processes.

This section is concerned with the extent to which the geographical structure of production is conditioned by the necessity of carrying on some activities close to particular resources and others in close proximity to consumers. It indicates also the resources of the United States and their part in American economy. This material serves to make more concrete the manifold activity of the millions of persons who compose the American economy. This report aids in understanding the basic national problem of unemployed resources, and should interest, particularly, students of economics and conservation.

The Study of Conservation, Friedrich, George W. Minnesota Department of Education and Conservation. St. Paul. 1940. 56 p.

During the past ten years the public has become interested in conservation. State departments of education are laying the foundation and school authorities are beginning

to offer it as a part of the curriculum. The study might be integrated in the regular courses if all teachers were acquainted with the essential philosophy and factual background. Since this is not the case, it is not now advisable to limit conservation to the incidental treatment it can receive in connection with other subjects.

Conservation is defined as the study and practice of wise utilization of resources to the end that the greatest number of people may be served best. The achievement of conservation is dependent upon education and social attitude. A comprehensive program makes use of four methods: restriction, restoration, production and distribution.

Resources of Minnesota which are discussed are minerals, water, soil, forests, wildlife, and human conservation.

Part 1 of the phamplet deals with the problems of conservation and their influences on social and economic progress. Part 11 is an outline of subjective material. Intended for junior and senior high level, the questions for study and activities are excellent. The bibliography is full and up-to-date. Much of the material is adaptable as textbook material, and makes much use of environment situations. As a guide for Minnesota teachers, the phamplet should be most helpful.

The Teacher Looks at Conservation, Fink, O. E. Division of Conservation and Natural Resources (in cooperation with State Department of Education), Columbus, Ohio. revised January 1942. 65 p. illus.

Ohio, in 1942, was initiating a conservation education project and this bulletin for Ohio teachers was issued to

acquaint them with the need for such a program, and give some idea of the direction the program would take. In a simple and non-scientific way, the general problems of conservation of natural resources, water and erosion, land use, health, and wildlife are discussed in relation to economic and social values. The report includes suggestions for activities which may be adapted to various grade levels (experiments, collections, exhibits, excursions, etc.).

The material is not in unit form, but is intended to aid teachers in beginning conservation studies. The bibliography is concerned with developing conservation attitudes.

The bulletin would be of use to any person who wants a general overview of the problems in conservation and their solution through education.

Third Biennial Report, (1935-1936) Minnesota Department of Conservation, St. Paul. December 1936. 280 p. illus.

The reports given by the various divisions of the department are: (1) Drainage and Waters--investigations and surveys made, worked with state and federal agencies on control structures and measures of soil erosion, tile drain repairs, etc.; (2) Forests--expanded and improved State Nursery, forest inventory and fire protection made, Christmas tree industry supervised, state timber sold, lectures, exhibits, movies shown; (3) Game and Fish--fish propagation at hatcheries, removed rough fish, refuges established and improved, supervised trapping activities, carried on research in wildlife food, disease, etc.; (4) Lands and Minerals--research studies made, issued pasture permited, licenses issued, etc.; (5) State Parks--maintenance, operation, and improvement of state

parks, presented ten historical pageants each year, completed four reels of sound movies, issued phamplets on facilities of parks.

This report describes the accomplishments and future plans of the Conservation Department of Minnesota. In all divisions, education of the public is stressed. It should be of interest and aid to other states.

Thirteenth Biennial Report, (1936-1937) Department of Conservation, New Orleans. 1938. 467 p. illus.

The function of the Department is to conserve the natural resources of the state so that there will be a minimum of waste, and to foster and encourage protection of wildlife. The most important fur-bearer is the muskrat. A description of its habits, trapping methods and also of the opossum, raccoon and mink is given. The wildlife sanctuaries of the state are the world's largest. Construction of quail, pheasant and turkey hatcheries is in process. One division of the department is concerned with oyster beds. The Geological Survey is concerned with reports and investigations of ground water resources. Minerals are described in each parish where they occur. Likewise, the sulphur and salt-domes are discussed. The Division of Forestry has 6,200,000 acres of forest land fully stocked with new timber, and advises and consults with landowners on proper cutting methods and development on a self-sustained yield. Prevention of forest fires is the greatest problem. The Bureau of Scientific Research and Statistics conducts sea and river shrimp studies, pollution studies, oyster investigations, compiles data, and answers innumerable inquiries. Educational programs include (1) intro-

duction of textbooks on conservation in public schools, (2) expanding and modernizing motion picture service, (3) museum services, (4) lecture services, and (5) exhibits.

This bulletin presents a very full and favorable account of the program carried out by the Conservation Department of Louisiana. The pictures are excellent. The material, for the most part, is on a sixth grade reading level. Parts could be used in a study of fur-bearing animals, preparation of pelts, the oyster and shrimp industries. The bulletin makes most interesting reading.

This Is Our Land, Cheyney, E. G. and Shantz-Hansen, T. Webb Publishing Company, St. Paul. 1940. 381 p. illus.

Our land is a country of fabulous riches in soil, water, forests, grasses, wildlife, and minerals. These natural resources aided one another in an intricate pattern called balance. The coming of white man disturbed this balance. In his effort to establish homes, acquire wealth, build roads, etc. man exploited the United States on the assumption that the riches were inexhaustible. About 1900 the nation began to take note of its mistakes. Guided by leaders such as Gifford Pinchot and Theodore Roosevelt, the conservation movement came into being. In general, the four principles of conservation are wise use, re-use, best use, and planned use. With these principles in mind, the resources are considered; (1) soil--causes of erosion and remedies; (2) water --misuse and best use; (3) forests-- aste, best uses; (4) grass--as a soil binder and as a food supply; (5) wildlife-- reasons for decline and means of restoration; (6) minerals-- careful use, better processing, substitutions, etc.; (7)

human resources--social health, education, recreation, employment.

This is a picture of the present extent, value, and current status of the nation's natural resources. How these resources have been used and what should be done to take proper care of them in the future is described. The book is interestingly written in non-technical terms, and is generously supplied with excellent photographs. Written primarily as a text in conservation for high school students, it also supplies information for the general reader.

Units in Conservation of Wildlife and Other Natural Resources, Gilpin, J. J. Kentucky Education Bulletin Vol. 9, No. 6. Frankfort. August 1941. pp. 8-375.

This course of study gives units for grades one through twelve on conservation in Kentucky. It uses the school grounds, communities and farms as problems for the projects. The units on animal, bird and plant friends and on soil, trees and water for the elementary grades are well integrated with all basic subjects. The units on vocational guidance in agricultural problems of conservation of soil, forests, fish, and game contain much helpful material for the teacher.

Given are a check-list of birds, pictures and descriptions of fish, lists of amphibians, mammals, and reptiles known to occur in Kentucky, forest trees of Kentucky, and a description of Kentucky State Parks.

The units are complete with objectives, activities and evaluations and source material clearly defined. I believe they would be more helpful if visual aids (movies, lantern-slides, film-strips, etc.) were listed, especially for the

lower grades.

The course of study is to be used by teachers.

Visualizing Conservation, Garden Club of America, Conservation Committee, New York City. Undated. 2 p.

Interest in nature is aroused through personal contact with it. Ways in which Garden Clubs may cooperate with schools and other groups are given. These include sponsoring contests for conservation posters, furnish material (aquariums, terrariums, library materials) for school nature rooms or clubs, give lectures with lantern slides or movies, sponsor exhibits and displays, participate in observance of Conservation Week, Arbor Day, etc.

This suggestive outline might well be followed by any civic group in the advancement and development of conservation.

Weather, Astronomy and Meteorology, United States Government Printing Office, Superintendent of Documents, Washington. Price List 48 - 32nd edition. April 1940. 15 p.

This is a list of government publications which are available on the above subjects. Much of the material is on high school level, but some of the phamplets, especially on floods and flood control, might be used at lower levels.

World Resources and Industries, Zimmermann, Erich W.. Harper and Bros. New York City. 1933. 824 p. illus.

Resources are inseparable from man and his wants; materials become resources only if, when, and in so far as they are capable of serving man's need. Variety of resources reflects not only differences in natural environments but also functional differ-

ences in forms of civilizations. As a result of changes in supply and demand conditions, agriculture has lost the position of dominance it once held. The differences between vegetal and machine civilizations are stressed. Agriculture is a composite of many economic activities, modes of living, and social functions. The important aspects covered are food resources, tree crops, and forests. The modern machine civilization depends upon the supply of mineral resources. The chemical industry rests solidly on the basis of modern science. Supplementation of the natural supply of raw materials by supplies from the test tube, waste pile, and junk heap has far reaching importance.

In Europe, conservation has long been accepted. Theodore Roosevelt aroused great enthusiasm in America, but few tangible and far reaching effects resulted. Conservation has become a business proposition concerned with oil, forest, water, and land resources. The world has become a resource hierarchy. The United States is extremely fortunate because of her economic youth and the large size of her total reserves.

This detailed account of world resources and industries is a study of the physical basis on which the structure of price economy rests. The fields of natural sciences, technology, and human, social, cultural and economic geography are fully explored. It gives the student an awareness and appreciation of the nature of our modern machine civilization, and the interdependence of nations. Throughout, emphasis is placed on functional relationships.

This material is for college students in courses of economics, world geography, and conservation.