# NATIONAL PARKS *Magazine*

Map and Compass Class at the
Maine Junior Conservation School

*Special Education Issue*

*November 1962*


Participants in a 1961 Conservation Education Center field trip gather to hear about the scenic and scientific interest of Nature Conservancy's Battle Creek Cypress Swamp in eastern Maryland.

*Conservation Education Center*

# *An Experiment in Conservation Education*

*By Mary Kovner*

WASHINGTON, THE NATION'S capital city, is surrounded by some of the most beautiful river and mountain country in the United States—and also by some of the nation's most acute problems of land and water management. A polluted Potomac flows through the nation's capital; high dams are proposed for the historic river and others dams for its tributaries, to the destruction of farm, forest and scenery. Highway construction and housing development proceed with thoughtless haste, usurping and destroying potential park and greenspace, burdening the river with silt. The need for sound conservation thinking, planning and education on the Potomac is, as elsewhere in the nation, painfully obvious.

A year ago a grant from the Eugene and Agnes E. Meyer Foundation enabled the National Parks Association to initiate a Conservation Education Center for the Greater Washington Region. Purpose of the center was to help inhabitants of the area to examine the problems arising from past and present misuse of the region's natural resources —its waters, forests and farmlands— and, by consulting together, to arrive at intelligent solutions.

The Center embarked on a three-fold program in September, 1961, with a series of lectures, film programs, and field trips. Lecture topics ranged widely —from a discussion of *Green Space for the Cities*, by Dr. Edward Higbee of the University of Delaware, to *Integrated Resources Management* by Dr. Albert E. Burke, once of the Yale University Conservation Program and later conductor of the public affairs television program *A Way of Thinking*.

Motion picture showings presented the best and newest films on the national parks and related subjects either from the Association's film library or elsewhere. Field trips took an average of two busloads of participants to the outer reaches of the Potomac River Basin, the high mountain wilderness, private preservations of the region and historic homes and sites.

During its first year an important segment of the Center's audience consisted of school teachers, teachers in training, school children, and college students. The initial mailing of the 1962 program announcement has been placed in the hands of every teacher in the Greater Washington area—some 18,500 of them. In addition, individual letters are written to the deans and chairmen of departments of local and nearby universities: this year a junior high school science teacher plans to take her entire class on a CEC field trip; a university class in ecology wants to join the Center as a group; one of the program lecturers has been invited to address the assembly of Washington's Teachers College. This is a program which is not directed primarily toward other conservationists, but to the general public. And important in this audience are the teachers, who instruct those on whom the future burden of conservation and preservation will fall. ◆



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Paul M. Tilden, Editor

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*Front cover photograph by Bill Geagan*



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# A School in the Woods

By Bill Geagan

*Photographs by the Author*

THE OBJECTIVE OF THE MAINE JUNior Conservation School, at Brewer, is to educate young men in the fundamentals of conservation. Additionally, it stresses the need for preservation, before it is too late, of as much of the State's remaining wilderness as may be possible.

The faculty of this remarkable institution in the woods is composed of dedicated men who know, understand, and love the wild places. They are men in all walks of life whose sound sense of values can separate the worthwhile and lasting from the artificial and perishable. All of them are members of the sponsoring Penobscot Conservation Association, which for more than twenty-five years has been fighting to save Maine's wilderness and its wildlife. It is a large organization, respected and powerful.

It has a large and growing membership and a fine clubhouse on Indian Point, in Brewer, high above the famed Bangor Salmon Pool on Maine's big Penobscot River. The clubhouse stands on the rim of the Association's thirty acres of beautiful mixed woodland, with its various species of wildlife, numerous bubbling springs, brooks, and small wild pond. This protected land adjoins fifty-two more such acres and a clubhouse owned for many years by the Penobscot Salmon Club. Many of the Salmon Club's members also are members of the Conservation Association, and both organizations work hand in hand in a common educational cause.

The Conservation School, which enjoyed its twelfth consecutive year this past August, operated at the widely known boy's rendezvous, Camp Jordan, which is owned and sponsored by the Bangor YMCA. When the regular summer-long YMCA session closes in early August, the Conservation School moves in for two full, study-packed weeks. More than a hundred different students are enrolled each week—all that can properly be cared for and taught.

### Criteria for Attendance

The students are very carefully selected. They are boys from thirteen to seventeen years old from all parts of Maine, and some other States, who prove to their various sponsors and to the Association's camp committee that they are deeply interested in the ways of nature and in the preservation of wilderness and its wildlife—and thus, fundamentally, in conservation.

Such proof is initially presented through carefully written essays. Many applications are reluctantly turned down. This is not a play camp, nor is it a place for the underprivileged or for the correction of delinquents. It is a school for intelligent and dedicated boys, with regular and strict outdoors classes that continue from 8:30 in the morning until 4:30 in the afternoon.

These are boys who will do what they can now, and in the future, in various capacities, both for conservation and preservation. Well over 1500 such boys have been graduated in the school's twelve years of operation. And now, so great is the demand for enrollment, the Camp is being enlarged and there is talk of expanding the session at both ends. And, too, the pressure for a girls' session is mounting. This is also being considered.

The Camp-School is situated back in the woods in a barely-touched wilderness region on the rugged shore of big Branch Lake. The narrow road twisting into the Camp is almost as rough and rugged as the surrounding terrain; and it will remain that way. The School includes a large assembly hall and office, modern kitchen and dining room, clean and spacious cabins for the students, a very large cabin for the faculty, an infirmary, two large lavatory buildings with hot and cold running water, and a large boathouse with boats and canoes, most of which were purchased by the Association. The place also enjoys electric power which is carried far back through the woods; water is piped to all but the sleeping buildings from a large pure spring in the woods.

The Association rents the Camp and pays the salaries of certain members of the regular Camp Jordan staff, which includes the Camp directors, chef and assistant, nurse, and some counselors, most of whom are University of Maine seniors. The Camp's health rating in the State is the highest. It is really surprising to find such a modern, spic-and-span settlement so far back in the forest.

The School is a non-profit project. Tuition is only $30 a week, including insurance. T-shirts and sweatshirts bearing the name of the School also are issued, and all students must wear them. The food bill runs in excess of $1000 each week, and each year the sponsoring Association gladly turns to its treasury for several hundred dollars to meet excess expenses. The many instructors donate their services.

### Conservation School Curriculum

Conservation is the key word at the School, and is the major course. Nature, which is a close second in importance, is presented and explained, not as a simple songbird-and-flower study, but in all of its mystery and ruggedness. Other courses, tied in closely to give the students a well-rounded outdoors education, include: forestry, map and compass reading, outdoors cooking, canoe and boat handling, first aid, fly and spin casting, swimming, pioneering, and woodcraft. Shooting classes with small caliber rifles and bows and

At the Maine Junior Conservation School canoes are utilitarian as well as recreational, playing a part in wildlife study on wilderness streams.

A wilderness-wildlife class makes its way through the old mixed-growth forest in the vicinity of Branch Lake, in Maine's Penobscot County.

The author of this article, who is director of the conservation course described on these pages, is seen giving an illustrated talk on nature and wilderness wildlife at the first specimen area of a conservation field trip.

arrows are held merely in the interest of safety and relaxing entertainment. No mention of hunting is ever made. Following each evening meal the students gather in the large assembly building from 7 to 9 o'clock for entertaining and instructive moving pictures on subjects included in the courses.

The vast, wild region in which the Camp is located is one of dense forests, the sprawling lake, boiling springs, mountains, brooks and racing streams. The lake supports large populations of lake trout, brown trout, landlocked salmon, and small-mouth bass. Eastern brook trout fan in the streams, and wildlife is plentiful in the woods. Moose, bear, deer, snowshoe rabbits, otter, beaver, bobcats, mink, weasels, fisher, raccoons, hawks, owls and many lesser species are numerous. The students have an opportunity to study many of these at close range.

The forest is an unbroken stand of old mixed growth, and stretches away in all directions—white pine, red pine, white, red, and black spruce, white cedar, balsam fir, hemlock, tamarack, beech, white, yellow and gray birch, poplar, aspen, basswood and others. Lesser plant life also grows in profusion. The region was once lumbered for pine in the long ago, but has not known the axe or saw since then. With its perpetual twilight, its coniferous and deciduous trees, soft, deep mosses, lichened boulders, abundant lesser plant life, down and decaying trees, and singing silence, this forest is indeed wilderness, an ideal environment in which young students may roam, study, and think.

My personal contribution to this conservation school is the supervision of such study. In addition to study walks through the woods on which the beauty and values of true wilderness are pointed out and explained, I also have, here and there along the way, several areas in which animal and plant specimens are displayed on long log tables. These places also include large blackboards on which lectures may be illustrated.

The relationships between all plant and animal life is explained, and it is pointed out how one species may depend upon others. Pencils and note books—and cameras, too—are very busy on such jaunts. Quite often we will pass a forestry or other class going in or coming out. The many study periods are serious and strict; time is precious, and not a minute is wasted.

Bird, mammal, reptile and amphibian tracks are studied in natural and manufactured mud areas, and the behavior of fishes of various species and in all stages of development is observed from heavily-wooded brook banks. The various foods of the carnivorous, herbivorous and omnivorous animals are discussed, and studied when possible. So are the insects, both those of the brook bottoms and the woods.

**Mr. Geagan, a resident of Bangor, Maine, has long been active in the field of conservation education. He is also a prolific writer on nature and the outdoor way of life.**

Entomology plays a part in the forestry study. So does actual fire fighting. The three types of forest fires are explained—crown, ground and duff, or underground. And the duff is purposely set afire by foresters of the Maine Forest Service, is allowed to burn for a time, and then is properly extinguished with hand tools and Indian pumps. The forest duff or mold in depths up to several feet also is carefully studied and its ingredients and value explained.

### State Officials Visit School

Visitors to the School include Maine's Commissioner of Inland Fisheries and Game, and the heads of the State's other conservation departments. Prime purpose of such visits is to talk to the students and impress on them the importance of the outdoor education program, and to point out their duty, as men of tomorrow, in the wise use of natural resources, including the intangible resources of the wilderness. "As legislators, landowners, lawyers, judges, governors, and workers in all other fields, banded together, you can one day accomplish much in this common cause," they are told.

Many of the students of earlier years at the School now hold responsible positions and are leaders in various conservation organizations both in Maine and other States. The plan is working well and much has been accomplished. It is doubtful that there is at present another education project exactly like this one in the entire country; but the results attained over the years seem to indicate that the program might well be picked up by interested public service organizations elsewhere in the nation.

CREDIT FOR THE BIRTH of this project, twelve years ago, must go to two men—Victor Viola, then president of the Penobscot Conservation Association, and Roland Chandler, general secretary of the Bangor YMCA. They are still leading the project. Neither man is a hunter or fisherman, but both love and appreciate the living wilderness; wild places as they were in the beginning. They realized the great and lasting values of such places as retreats for those weary in mind and body, and also the need for a more general public understanding of conservation principles.

They realized, too, the truth of the proverb which says: "You can't teach an old dog new tricks," and so they turned to youth. The unpaid instructors who the doubters said would not come, *did* come; woods guides, foresters, naturalists, school teachers, college professors, biologists, conservation officers, and more; enthusiastic and ready to tackle the experiment. They have continued to come, and the good seed is being planted in fertile soil. The educational project which many called impossible is a robust reality, producing its crop of eager young conservationists year by year. ■


An outdoor cooking class ties in nicely with lessons in forest fire prevention and control. Foresters from the Maine Forest Service set fire to the deep duff of the woods, and then demonstrate proper fire control techniques.

# Outdoor Conservation Workshops for Teachers

By Francis J. Schadegg

OUTDOOR STUDY OF THE NATURE, occurrence, and management of natural resources is a more pressing need than ever before for both the people of the United States as well as those of other countries. The strain on the capacity of basic natural resources is pyramiding worldwide, at a phenomenal and unprecedented rate. Not only are per capita demands for products increasing as a result of technological and scientific advances and rising levels of living, but the capacity to utilize resources is ever expanding. The past decade or so, particularly, has seen hitherto underdeveloped countries of the world, and undeveloped resources of our own country, burst into a frenzied development at use rates never before experienced.

Two additional factors, which increase resource demand and decrease understanding, compound the need for conservation education. One is the tremendous number of people added to world population each day; and the other, a worldwide increase of the proportion of people living in cities. In another forty years the population of the United States could be nearly doubled, even by conservative estimates of population increase. Well over 90 percent of this increase will undoubtedly be in urban areas. Under these conditions people grow up and mature with little opportunity for personal contact, observation, or understanding of the nature of our basic natural resources. This is a far cry from the small rural community and almost daily association with nature that has been an important element in our American heritage. If there are doubts concerning a continued increasing urbanization, with its separation of man and his daily contact with natural things, ask this question: "Where will most of employment of the future be found, inside or outside of the metropolis?" Machines are replacing men in agriculture, forestry, mining, and other areas directly related to the conversion of natural resources into usable products. The need for men will not be eliminated in non-urban types of employment, but a proportionately fewer number will be needed.

What has all of this to do with outdoor training of teachers and students in conservation of natural resources? The answers, in summary, are that:

The demand for products from natural resources is increasing rapidly in both quantity and rate of use.

Machines are increasing the capacity of man to use resources rapidly and to move more and more intensively.

Urban living is eliminating much of the knowledge and understanding of natural resources that people would have as a result of living in close daily association with nature. Urban inhabitants, lacking that knowledge and understanding of natural resources and their conservation, are the very people who will influence national and local governmental policies concerning resource management. They will also be making decisions and influencing policies of private industry and organizations concerned with using natural resources.

The events of the Twentieth Century have established a challenge for teachers and the educational system in regard to the management of natural resources for continued growth and prosperity. One of the more important means of acquiring the knowledge and experience that will lead to an understanding of resources and the problems of their management is out-of-doors study, in the field, where resources exist and where their management and use is taking place. Most fundamental to our lives and material aspirations is the continuing availability of basic natural resources; soil and space, water and air, vegetation and wildlife, and various minerals.

The need for a better understanding of resource management and more knowledge of natural resources has not gone unnoticed. A growing number of natural resource conservationists and organizations have made themselves heard—private citizens, public leaders, government and its agencies, private agencies, industry and labor, educational and scientific leaders and organizations, and others. All have made strong appeals for better private and public understanding. Much good work has, and is, being done. But the majority of the people who will be managing the resources and influencing or making public conservation policy in the next quarter-century are in our schools now—or will be soon.

This, then, is the challenge to educators—our future population must rely more upon them and less on everyday association with natural resources for their knowledge and understanding. Field study—the outdoor workshop—is a well-proved method of study in all of the fields of the natural sciences. For the millions of children and teachers in our urban society it offers one of the more important means of studying natural resources as they exist in all of their complex interrelationships, both natural and with men. Teachers should learn one of the best techniques of studying resources and their management—that of studying a resource where it exists and where it is being exploited.

Outdoor workshops have been operated in many different ways, but always with similar purpose and roughly similar techniques:

Outdoor study takes place in a laboratory in which man and nature can be observed at work and where the results of this relationship can be observed and measured.

The nature of a particular resource can be studied in its real setting among other natural phenomena where natural interrelationships exist.

Scientists and the resource with which they work can be brought together with the workshop student in a field site.

The workshop puts the student, the scientist, the resources, and the persons directly concerned with using a resource together so that all aspects of the management problem can be discussed from a practical and theoretical viewpoint.

Above: a conservation workshop group prepares for intensive forestry study at the Clearwater Tree Farm of Potlach Forest, Inc., in Idaho. Below: a college workshop group learns about the characteristics of a southeastern Washington soil profile.

Forum discussions in both classroom and field settings include the students, scientists, technicians, farmers, industrialists, foresters, and others concerned. Here the real complexity of the resource management problem may be most fully realized.

The workshop student learns by an actual experience of the nature and availability of sources of literature, of technical and scientific specialists, of people concerned with production, and of people charged with planning and management responsibility by industry and government.

The following series of examples are real ones, with names omitted.

*Soils and Agriculture*

For a period of three days the workshop group, accompanied by County Agricultural Extension specialists, Soil

Conservation Service personnel, Soil Conservation District supervisors, and State Agricultural College experts visited an agricultural area and studied with the farmer operators of three separate farms.

Amounts and kinds of soil erosion were observed and measured.

Soil profiles of several different kinds were studied in the field and their characteristics examined and explained.

Cropping and farm management practices and farm plans were discussed and examined both from the farmers' point of view, and that of the scientist-technician and the economist.

Local farm economics, the Extension Service program, the State College and Experiment Station work, and the policies and recommendations of the local Soil Conservation District were studied. This was all in relation to existing conditions in the area studied.

Local flood problems in relation to agricultural practices and soil conditions were observed as well as problems of wildlife management and public recreation.

The laboratories, experimental plots, and scientific personnel of the State Agricultural College in the area were visited. Their relationship to the conservation problems and practices of the farming area visited were examined by panel and forum discussion.

*Forestry and its Complex Position*

For five days the workshop group traveled and lived in a forest region managed by a private lumber company. Company personnel—technical, scientific, managerial, and workers—accompanied them at all times. Everything discussed and studied was based upon direct examination and field experience. The study included:

Examination and identification of timber types. These were related to growth sites, economics of timber production, growth rates, and all aspects of timber management.

Site characteristics were identified and growth rates measured by increment borers.

Fire control problems were studied and fire protection facilities were visited and examined.

Examples of diseases, and pests and insects were identified, control methods and research being carried out were discussed.

Timber harvesting and replanting, and practices to achieve sustained yield forestry were observed.

Problems of forest soil management and erosion were discussed and examples examined.

Multiple use of a forest region was seen in action—watershed, management, public recreation, game and wildlife management—in a setting of cooperation between government, industry, and the public.

An integrated forest-products plant was visited to relate maximum use, minimum waste and efficient multiple use to sustained yield forestry.

For two days the workshop group traveled and camped in a forest region under the direction of U. S. Forest Service personnel. In addition to a study of forest types, growth habits, soil and site, sustained yield forestry, forest farm and harvesting practices, multiple use concept, a number of other things were studied. Thus:

Experimental planting, disease control, and harvesting methods were observed and some results measured.

Pros and cons of wilderness areas were discussed.

Fire fighting in action and fire results were observed and measured.

Multiple-use aspects of National Forest management were discussed and the following examples studied in the office records and observed in the field: snow studies, watershed management, public recreation, game management, timber marketing and sales, and forest management.

For three days the workshop group traveled and camped with representatives of the Bureau of Reclamation, State and Federal game biologists, and Agricultural Extension Service personnel. They spent time at three farms, three agricultural processing plants, two game and wildlife management projects. They visited and observed the relationships of the water storage facilities, water distribution system, and drainage installations related to land reclamation and irrigation. Items observed, studied, measured, and discussed included:

The nature of arid land soils and the problems of reclaiming these for agricultural use.

Farm management and marketing problems as they related to the nature of the area studied.

The change in wildlife population and the problems and opportunities in inter-relating agriculture, wildlife and public recreation, land and water management.

Fish hatcheries, migratory game bird refuges, stocking of new lakes with fish were observed and studied.

The relationship of agricultural marketing to production, land management, and reclamation was studied *in situ*.

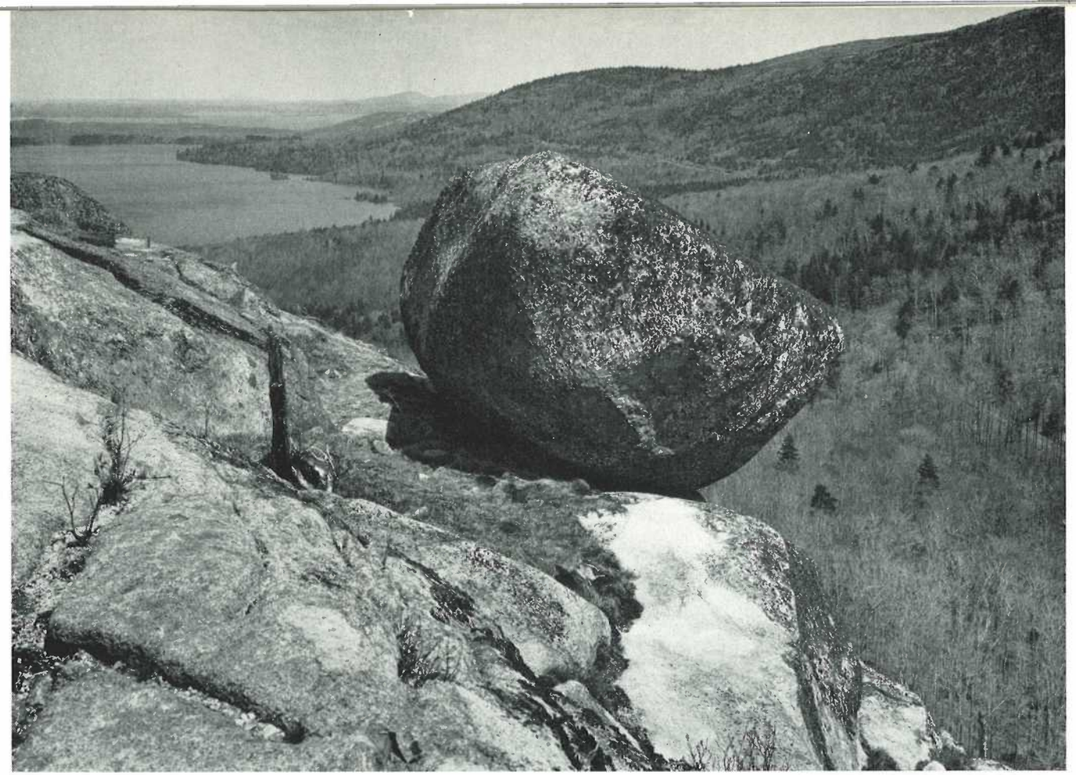
Many other examples of workshop studies could be cited. All involve study on the site with the resource complex, the scientist-technician, and the people managing the production from resources. The nature of the resources and the complex management problems are interrelated in an on-the-spot study.

The outdoor workshop refines understanding, adds to the specific knowledge of a subject, and lends a degree of completeness to investigation that cannot be equalled by classroom, textbook, or indoor laboratory study. It does not replace the conventional indoor study, but in an unparalleled manner supplements it and makes it more vital.

The hundreds of outdoor teacher workshops need to be thousands, to serve the nation's teachers and their young charges. School administrations' support and enthusiasm for these workshops is not yet sufficient, and must be increased. Scientists and technicians, though willing and eager to help, are not sufficiently numerous nor free from other commitments to devote much time to outdoor instruction. Neither are they always fully qualified to present ideas or facts in a way that young minds can accept and understand. Teachers, as a consequence, must be prepared to use out-of-door laboratories effectively. The outdoor conservation workshop is without comparison an excellent and essential method for training teachers. ■

**Prof. Schadegg is chairman, the Department of Geography and Geology, Washington State College.**





*Photograph courtesy National Park Service*

**Over the northern third of the United States, and at higher elevations elsewhere in the country, continental or local ice sheets have played an important part in shaping the surface of the earth. In the above photograph a large boulder left by the retreating Pleistocene ice maintains a firm balance atop a precipitous slope of the South Bubble in Acadia National Park.**

# Workshops in Earth-Shaping

By Paul M. Tilden

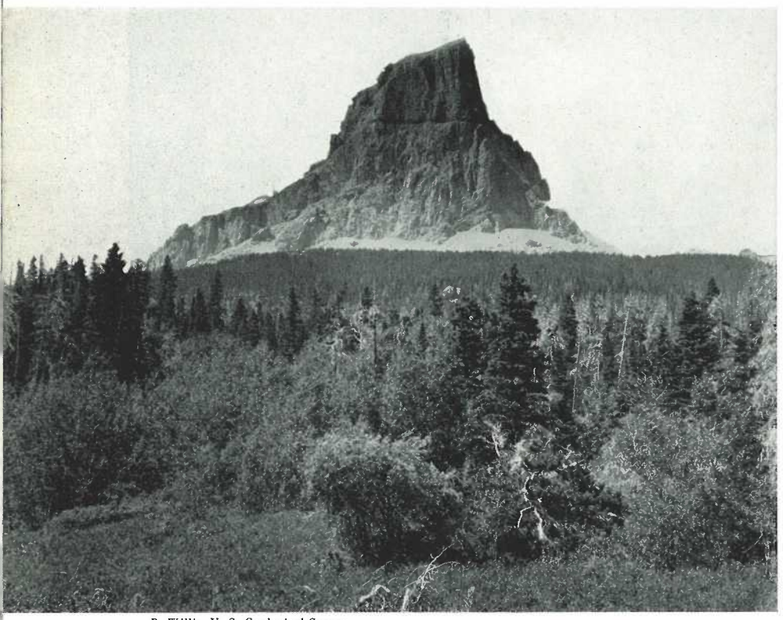
"FOR MANY PURPOSES," WROTE Dr. John C. Merriam a number of years ago, while he was president of the Carnegie Institution of Washington, "the purely educational value of our National Parks is far beyond that of any regularly established formal educational institutions." He continued: "Among the most important features are those which concern the nature of the earth—the manner of its building—the forces which have come into play—the meaning of the almost limitless history of earth-making as it is pictured before us."

In thinking about his words, we can be sure that he meant to cast no reflection on the processes of formal education. To the contrary: Dr. Merriam was himself an able educator, as well as a brilliant writer, and he had, before his presidency of the Carnegie Institution, come up through the professorial ranks of the University of California to eventually become Dean of Faculties.

What then did he really have in mind in thus extolling the great educational values of the national parks—especially in regard to the nature of the earth's surface and "the manner of its building"?

Dr. Merriam did not mean to imply, of course, that casual park visits of the "tourist" sort would necessarily lead to proficiency in geology, which has become as highly specialized as any branch of the natural sciences. Nor did he mean that a specialist's detailed

knowledge would be at all necessary—perhaps, indeed, even desirable—to a full appreciation of the prime forces which have built our mountains and shaped our plains, our rivers and canyons, lakes and seashores. He was thinking of the national parks as great classrooms in which visitors, as students, may see as little or as much of geologic fundamentals as they please; classrooms in which, as another writer has observed, "there are no marks, no examination papers."



*B. Willis, U. S. Geological Survey*

**Large earth movements along low-angled breaks, or faults, in the earth's crust may result in the slow transportation of great rock masses over adjacent formations. Chief Mountain, on the northeastern edge of Glacier National Park, is part of a rock mass which was moved many miles to the east of its original locality by the earth-process known as "thrusting."**

The geological forces which are so strikingly manifest in many of our national parks and nature monuments are basically two: those which tend to build and those which are forever at work destroying that which is built. Mountains are raised by the stresses that operate in the outer crust of the earth, and the forces of erosion—wind, water, ice, heat and cold, natural chemicals—work ceaselessly to level the mountains and spread them grain by grain, particle by particle over the lower lands and eventually bring them to the seas. Geologists know little, really, about first causes of the pressures and strains that buckle or break the earth's crust into mountain ranges like the Appalachians, the Rockies, or the Sierra Nevada; but one need not be a geologist to appreciate the immensity of the forces involved. One needs be nothing more than an interested observer.

Several of those national parks which sit astride the Rocky Mountain chain furnish superb examples of the heaving and breaking to which the earth's crust may be subjected; Glacier, notably, or Rocky Mountain National Park. In the sheer rock walls of these high-mountain parks layer after layer of earth-history is revealed; history ranging from the "recent" of the past tens or scores of million years to formations that were ancient, in the geologist's time scale, a billion years ago. To the casual visitor these broken masses are magnificent scenery; with only the addition of a modest interest in the manner of the earth's building, they become educational as well as magnificent.

### Mountains that Move

The forces that create mountain ranges work slowly, even in terms of geological time; and sometimes they not only raise mountain ranges but move them bodily across the face of the land for many miles. From Front Royal on the north to Rockfish Gap in the south, the Skyline Drive of Virginia's scenic Shenandoah National Park snakes for something more than a hundred miles along the rocky spine of the Blue Ridge Mountains. The Skyline Drive, however, follows in a general way the summit of a great mass of ancient rock which has been moved by a geologic process called "thrusting" many miles to the west of its original position in the earth's crust; and the whole jumbled, weathered wreckage actually lies on the younger rocks of the Shenandoah Valley floor.

In the East the mountains are for the most part heavily clothed with forest, and the story of earth-shaping is usually not crisply worded. But a similar and naked example of mountain-moving may be seen and studied on the northeastern boundary of Glacier National Park in Montana. There the steep bulk of Chief Mountain sits atop a group of younger rocks, its original horizontal layers still largely intact, as one of the geologist's "mountains without roots." This is a mountain that has been moved many miles to the east in the by-play of earth-shaping.

Another category of earth-shaping forces—more spectacular, perhaps, but of lesser importance in total effect—is that which has created such natural wonders as the geyser basins of Yellowstone, the Devil's Tower in Wyoming, Crater Lake in Oregon, or Mount Lassen in California. All of these scenic and scientific spectacles were brought into being by the forces of volcanism; they are essentially the exterior manifestations of the outward movement of molten rock from the deeper parts of the earth.

Some of the monuments to volcanism which are preserved in the park system were born in a relatively quiet fashion—perhaps even beneath the earth's surface, to be exposed later by erosion. The Devil's Tower, in the Wyoming national monument of the same name, is a strange fluted basaltic monolith which was probably once forced into the upper crust from below as a "plug" of molten rock, later to be bared by the slow forces of rock-removal. The great lava flows preserved in Craters of the Moon Monument in Idaho, with their cinder and spatter cones and conelets, welled up and sputtered along a number of "rifts" or weak zones in the earth's outer crust; though their arrival at the surface (in the relatively recent past) would have been judged sufficiently fiery and spectacular by a human observer, the birth of otherworldly Craters of the Moon was quiet, relatively speaking.

Other national preservations, like Crater Lake Park in Oregon or remote Katmai Monument on the Alaska Peninsula—to name but two examples—tell a story of volcanic violence which can best be interpreted only in the imagination of the visitor-observer. At Crater, for example, the entire top of a mountain is thought to have collapsed into a great interior pit whose rock-substances had been blown away in extravagant violence; while at Katmai, in 1912, a series of explosions focused about Novarupta Volcano, near Mount Katmai, reshaped the earth's surface over a wide area in one of the greatest blasts, natural or otherwise, of recorded time.

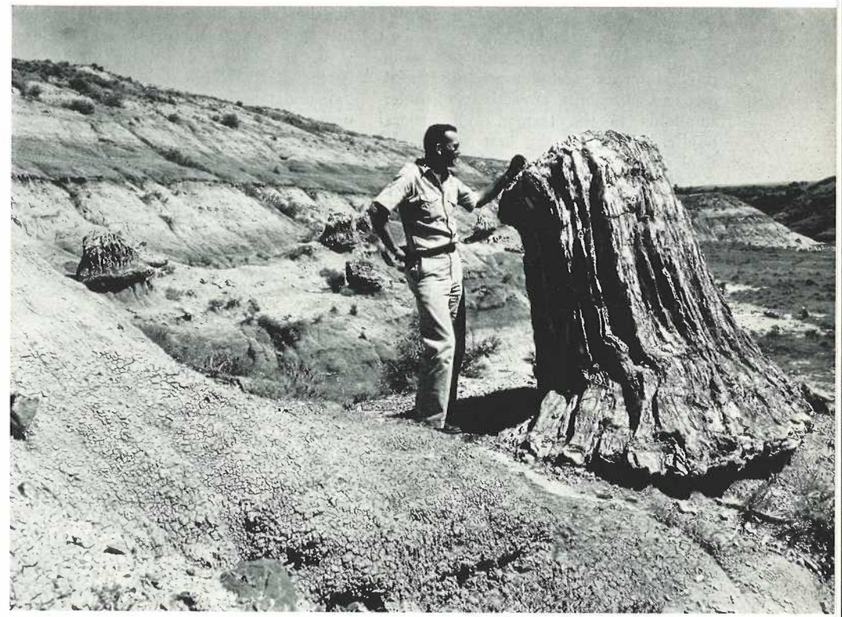
### Levelling the Land

But all the forces of construction, whether they work toward the creation of mountain ranges or the merest wrinkles on the surface of the earth, are opposed by the forces of erosion which would bring all land to the level of the seas. The visitor at Grand Canyon National Park admires the handiwork of erosion in the color and immensity of cliff, crag and canyon; and he sees the immediate agent of destruction in the Colorado River far below him—running water, a river brown with the substance of the mountains and plateaus of a great river basin. This is erosion on the grand scale. However, the attack of water on the *softer* layers of the land is superbly detailed in preservations like Bryce Canyon National Park, Badlands National Monument, or the Petrified Forest National Monument.

There are other and less obvious forces which operate against the land; frost, which chips away at exposed rock surfaces; snow and ice, which move the frost-chipped rock particles along their journey to the sea; wind, which etches and cuts through the power of driven sand; the natural chemicals of rain and groundwater which slowly dissolve and carry away the mineral constituents of exposed rock surfaces.

The process of rock destruction by chemical attack goes on under certain conditions even below the surface of the earth; such magnificent caverns as Carlsbad in New Mexico, Mammoth in Kentucky, or Lehman in Nevada—all preserved for the public in the national park system for enjoyment and study—are examples of this specialized sort of earth-destruction.

All of these forces—those which build and those which destroy—operate today just as when the world was young, shaping and changing the face of the country in which we live, as that of the world. Many of the units of our national park system furnish us with superb type areas in which a general comprehension of this never-ending war-between-the-forces may be obtained. And this, it is safe to say, was the educational value which Dr. Merriam believed was "far beyond that of any regularly established formal educational institutions." ■



*Jack Boucher, National Park Service*

**The forces of erosion, which are ever working to bring all land surfaces to a common level, have in the photograph above uncovered a large petrified stump, still standing in its original vertical position atop the silts and sands of Badlands National Monument in western South Dakota. In the soft sedimentary beds of Badlands erosion proceeds at a relatively rapid pace.**

*A scientist looks at a new book and a serious issue in*

# *Silent Spring*: An Appraisal

By Clarence Cottam

*President, the National Parks Association, and*
*Director, The Welder Wildlife Foundation*

RACHEL CARSON, ACCOMPLISHED BIOLOgist and eminent writer, is best known for her superior ability to accurately interpret complex scientific information and make it attractive and understandable to the layman and general public. Author of the best sellers and Book-of-the-Month Club selections *The Sea Around Us* and *The Edge of the Sea*, she has also written other books and many papers that have been widely acclaimed.

Her latest contribution, *Silent Spring*, is just off the press. However, it had been previously published in a greatly condensed version in three June installments of *The New Yorker*. In three short months it already has stirred the nation as have few other serious books of this generation. It is quite probable that future generations may rate this well-written volume as one of a half-dozen major publications of our age.

Miss Carson became so concerned with America's almost indiscriminate, widespread and generally irresponsible use of poisonous pesticides that she spent four and a half years gathering information from all possible sources in America and abroad on the effects our commonly-used pesticides are having, or might have, upon man and his natural renewable resources, including his domestic and wild animal and plant life, the soil and its innumerable organisms, and our surface and underground water supply. The facts set forth are truly appalling. Case histories and facts presented are well-documented and listed by page and chapter as a supplement of fifty-four pages following the text.

Miss Carson is a quiet, modest, but scholarly lady who, with many others, has long been convinced that man is a product and an integral part of nature, and that if he is to permanently succeed as the highest product of life he must work with nature and not attempt dictatorially to conquer her.

Albert Schweitzer had the same apprehension when he exclaimed: "Man has lost the capacity to foresee and to forestall. He will end by destroying the earth." E. B. White cautioned that he was "pessimistic about the human race because it is too ingenious for its own good." "Our approach to nature," he warned, "is to beat it into submission." He concluded that "we would stand a better chance of survival if we accommodated ourselves to this planet and viewed it appreciatively instead of skeptically and dictatorially." With these two quotations from Schweitzer and White as a foreword, Miss Carson commences her timely and urgently needed book.

### Reaction to "Silent Spring"

The condensation occurring in *The New Yorker* magazine has indeed caused a stir. Because of this public alarm, employees and operators or organizations engaged in control work, along with pesticide manufacturers, with their heavy investments, are understandably concerned lest their work or investments be endangered. Government itself has been forced to take a more serious look at its own leadership, programs and procedures of control. *Chemical World News*' principal headline for August 13, 1962 (40:33) reads: "Industry Maps Defense to Pesticide Criticisms." The article appropriately quotes Miss Carson's philosophy of control as expressed in *The New Yorker* and as contained in the last few paragraphs of Chapter 2 of her book.

It is well to understand this viewpoint of Miss Carson's: "My contention is not that moderate chemical controls should never be used under any circumstances but, rather, that we must reduce their use to a minimum and must as rapidly as possible develop and strengthen biological controls. I contend that we have put poisonous and biologically potent chemicals indiscriminately into the hands of persons who are largely or wholly ignorant of the harm they can do. There is still a very limited awareness of the nature of the threat. This is an area of specialists, each of whom sees his own problems and is unaware of or indifferent to the larger frame into which it fits. It is also an era dominated by industry, in which the right to make money, at whatever cost to others, is seldom challenged. We shall have no relief from this poisoning of the environment until our officials have the courage and integrity to declare that the public welfare is more important than dollars, and to enforce this point of view in the face of all pressures and all protests, even from the public itself. On those occasions when the public, confronted with some obvious evidence of the damaging results of pesticide applications, has ventured to question the use of poisonous chemicals, it has been fed little tranquillizing pills of half truth. We urgently need to put an end to these false assurances. It is the public that is being asked to assume the risks that the insect controllers calculate. The public must decide whether it wishes to continue on the present road, and it can do so only when it is in full possession of the facts. In the words of the French biologist Jean Rostand, 'The obligation to endure gives us the right to know.'"

The same edition of the *Chemical World News* quotes the appraisal of *Silent Spring* and Miss Carson's views by Dr. George C. Decker, economic entomologist of the Illinois Natural History Survey, and a former advisor and collaborator on insect control to the U. S. Department of Agriculture, reliably reported to have been on occasion a paid consultant to certain pesticide companies. He says: "The *Silent Spring* poses leading questions, on which neither the author nor the average reader is qualified to make decisions. I regard it as science fiction, to be read in the same way that the TV program 'Twilight Zone' is to be watched."

This is indeed interesting and a bit perplexing in view of this scientist's published views of just a few years ago. Before the Fifth Annual Meeting, North Central States Branch American Association of Economic Entomologists' 29th Annual Conference of the North Central States Entomologists, March 23 and 24, 1950, at Kansas City, Dr. Decker cautioned his fellow entomologists: "I would like . . . to repeat again a statement I made at Peoria two years ago, 'Chemical control of insects is only one phase of insect control, yet it appears that the urgent demand for information on new insecticides has led all of us into a large-scale, fadistic swing to insecticidal investigation at the expense of our other research. . . . I believe . . . (as) some of our illustrious predecessors . . . (have expressed) that man, as a rational and intelligent being, should be able to outwit insects and not rely entirely upon chemical warfare. . . . Insecticides are extremely useful in protecting crops from immediately impending damage, but have little effect in influencing insect abundance from one year to the next. . . . Insecticides are fire-fighting, not prophylactic, weapons. . . . (They are) habit forming in that once their use is started their continued use becomes more and more necessary. Although the fruits in small home or other unsprayed orchards are usually wormy, they are seldom as badly infested as the apples on a few check trees in a sprayed orchard or in the commercial orchard the first year it is abandoned. . . . About all we have ever obtained from insecticides was annual crop protection.

"In 1941 . . . J. R. Parker . . . pointed out that . . . by our own testimony annual losses due to insects remained at about 10 percent from 1889 to 1941, despite the fact that expenditures for insect control increased from $75,000.00 to over $15,000,000.00 during that period. Now we have added ten more years and still no change. . . . It seems quite obvious to me that we should not and cannot consider the use of chemicals a substitute for sound cultural and other biological control methods.

"We have been amply warned that many of the new insecticides can and often do upset the biological balance in an area and while promoting more effective control of one pest we produce an equally or even more destructive outbreak of some other lesser pest. . . . We have orchardists who in less than 3 years now insist that even with greatly improved codling moth control, they are now putting more apples in the cull pile than they were before DDT came into the picture.

". . . When properly used they (insecticides) are very valuable tools, but like the A-bomb, if unwisely and wrongly used, they may lead us to our doom.

"It seems to me we are in the position of the drunk in a high-powered car approaching a stop and go light. We had better sober up, stop, look and listen for danger signs before we proceed much further."

### Advice Hardly Fiction

It would appear that Dr. Decker's sober and timely advice, given to his colleagues of 1950, is not at all incompatible with the conclusions objectively arrived at and reported by Miss Carson in *Silent Spring*. These mature and well-considered comments by Dr. Decker in 1950, and Miss Carson's in 1962, are not fiction, despite Decker's recent glib pronouncement.

Miss Carson and all of us have the inalienable right and the responsibility to question the wisdom or the justice of the widespread drenchings with highly toxic, stable, and broad-spectrum pesticides to which this nation is being subjected. To protect our civilization and our future, it is not unreasonable to insist that control operations which use such deadly poisons be based on a genuine public need and that these programs be guided by sound, mature and objective research. *Silent Spring* documents too many examples in which this has not been the case.

Certainly documented facts obtained during the past three or four years should present indisputable evidence that the too frequent wholesale broadcasting of pesticides, or the consumption of potent poisons inadequately tested, may be disastrous to both man and his resources. Attitudes like those exhibited in Dr. Decker's charge of "science fiction," or that of a leading official who chided welfare workers that they need not get alarmed over the use of chemical controls "because we have not died yet" are, at least, very shortsighted. Perhaps the best answer to them could come from the ten thousand sorrowing West German parents, and parents of many other countries, of pathetically deformed babies born of mothers who took the medically prescribed but inadequately tested tranquilizer, thalidomide, during their pregnancies. Within a ten-year period from 1950 to 1960—the period covered by the alarming rise in use of modern pesticides —the incidence of leukemia and other malignant diseases of the blood-forming tissues, as measured by mortality, rose 52.2 percent.

Environmental diseases related to the use of various toxic substances have been increasing. Dr. M. M. Hargraves of the Mayo Clinic believes that "the vast majority of patients suffering from the blood dyscrasias and lymphoid diseases (who enter the world-famous Mayo clinic) have a significant history of exposure to the various hydrocarbons" used in most pesticides of today. Dr. Hargraves has documented case histories of many patients.

It is well known that indirect effects of pesticides usually are long delayed and difficult to trace. For this reason, it is wise to be prudent and conservative. We have everything to gain and nothing to lose. When a malignancy or other slowly developing consequence of the ingestion of poison becomes evident, it often is too late to do much about it. Some of the direct and immediately adverse effects of pesticides upon man and wild and domestic life have been clearly documented. It is also well to emphasize that upwards of 150 of our most damaging pests now have developed a high degree of immunity or resistance to various families of highly toxic chemicals. It is apparent, therefore, that the present poison approach is not the answer. The history of the chemical poisoning approach shows that, of necessity, the program must be expanded each year with more and more chemicals of increasing toxicity. This approach permits no termination of the problem or programs.

### Author's Concept Valid

Already Miss Carson has been accused of bias and overstatement of her case. In a study so complex and intricate, where so much essential research has been subordinated to the development, production, and field use of new pesticide compounds, it would indeed be surprising if a few errors, wrong conclusions, or minor misstatements did not later show up. These are merely details. There is no error in the author's basic concept that we are poisoning our environment—our soil, water, air, plant life—and that it is in the public and national interest to "sober up and stop, look, and listen." What is "fiction" today will likely be cold reality tomorrow. Sound, mature, and objective research is called for.

Miss Carson's *Silent Spring* gives indisputable evidence that: (1) this generation's manipulation of the basic elements of nature by government and private industry, in the use of drugs, pesticides and radiation, is not under safe control; (2) the indirect and total consequences to man and his renewable natural resources from the present widespread and often unrestrained dissemination of these substances into our environment are only vaguely known, and probably some effects cannot yet even be guessed at; and (3) we have reached the

*(Continued on page 21)*

# *Your National Parks Association at Work*

### *Conservation Education Center Commences Fall Program*

Under sponsorship of the Conservation Education Center, an activity of the National Parks Association, the Education Program on Conservation in the Greater Washington (D.C.) Region opened during early October at the Smithsonian Institution Auditorium in Washington with a lecture by Miss Rachel Carson. Author of a number of outstanding and widely read natural history interpretive books during recent years, Miss Carson spoke on the biological impact of modern insecticides and herbicides on the natural environment. Joining her in a panel discussion of the subject were Dr. Clarence Cottam, director of the Welder Wildlife Foundation at Sinton, Texas, and Carl W. Buchheister, president of the National Audubon Society.

On October 20 and 21, the first field trip of the fall Education Program took participants to the Reddish Knob area of the George Washington National Forest near the Virginia-West Virginia border, within the watershed of the Potomac River, for field studies in land and water management under the guidance of Professor Harry G. M. Jopson of Bridgewater College.

The Conservation Education Center's program continues during November with a showing of select and up-to-date motion pictures on national park and related subjects on the 6th, again at the Smithsonian Institution's Natural History Building on Constitution Avenue in Washington, without charge to the public.

Field trip #2 for Fall, 1962, will take place November 10 and 11 with visits to the sites which have been selected for dam building along the Maryland and Pennsylvania tributaries of the Potomac River by the Corps of Engineers, as well as incidental visits to nearby historical sites.

The Fall educational program will close November 27 with a lecture at the Smithsonian Institution Auditorium by Professor Ian L. McHarg, chairman of the Department of Landscape Architecture at the University of Pennsylvania. Professor McHarg will discuss the theoretical and practical aspects of city planning, need for which has become so appallingly apparent in and about our great American cities during recent years. Professor McHarg has served as a planning official in the Scottish government and is also associated with the Town Center Park in the Southwest Redevelopment Area of the nation's capital.

National Parks Association members living in the Greater Washington area who may wish to attend the CEC's educational events (as well as other interested members who may coincidentally be in Washington) need only to get in touch with Mrs. Mary Kovner, manager of the Conservation Education Center, 1300 New Hampshire Avenue, N. W., for further details as to the November portion of the Fall Education Program.

### *Atomic Energy Commission Defers Project Chariot*

A recent announcement of the Atomic Energy Commission has indicated that plans for Project Chariot, a part of the Commission's Plowshare Program for investigation and development of peaceful uses for nuclear explosives, have been postponed. Project Chariot is a Commission scheme to excavate an artificial harbor on the Arctic coast of Alaska not far from Point Hope, an Eskimo village.

The proposed operation has been severely criticized by conservationists, conservation organizations, and at least a part of the general press as an experiment which would pose a serious moral problem in the nation's dealings with a politically voiceless people, and subject them to undue biological risks. It has been contended that the experiment would serve no useful purpose and would only add to the world's already liberal heritage of radioactive debris. (Project Chariot has been discussed editorially in this publication: see *National Parks Magazine* for December, 1961, page 2; and the issue of May, 1962, page 15.)

The Commission news release dated August 24 had this to say, in part: "The Atomic Energy Commission has recently reviewed plans for Project Chariot, a nuclear excavation experiment proposed to be conducted on the Alaskan coast near Cape Thompson, and has decided to defer, for the present, any recommendations to the President on whether to conduct the experiment."

### *Association Protests Northern Cascades Scooter Policy*

During recent months the National Parks Association has expressed its deep concern, in letters to National Forest Service officials, over the rapidly growing use of motor vehicles—especially those of the two-wheeled varieties collectively known as "motor scooters"—off the established roads of national forests and on national forest trails in areas classified other than wilderness, wild or primitive, where their use is already excluded. The Association's attitude toward the matter was summed up by its executive secretary, Anthony Wayne Smith, in an editorial in *National Parks Magazine* for the past June titled "All Things to All Men."

A policy for the use of motor scooters on national forest trails in Oregon and Washington was outlined during early summer by the Forest Service's regional forester of the Pacific Northwest Region, J. Herbert Stone. The policy stated that national forest trails in other than wilderness-type and similar areas in which motor vehicles are already excluded will be open to two-wheeled motor vehicles, except where their use "will damage resources, endanger the public, or seriously interfere with other important public uses or values."

In a letter to Edward P. Cliff, Chief of the Forest Service, Executive Secretary Smith lodged a vigorous protest against the announced policy. "If the Forest Service permits the increasing use of these objectionable vehicles off the established roads in the national forests," wrote Secretary Smith in part, "the beginning of the end of the forest experience for all people who love the forests—hikers, campers, fishermen and hunters—is in sight." The secretary reiterated the Association's view that responsibility for national forest protection against the "mechanical mules" lies with the Chief of the Forest Service and not with regional foresters.

During August Chief Cliff replied to Mr. Smith's protest in a letter which indicated that the Forest Service contemplates no change in its motor scooter policy. "We believe that our present policy gives sufficient direction to insure protection to land and resources and the safety of the many people who use the Forest for different types of recreation," said Mr. Cliff in part. "We must consider those who travel afoot or on horseback and those who wish to use motor vehicles."

Thus it would appear that for the present at least Service policy in respect to the national forests is still formulated on the "all things to all men" basis.

### *Marble Canyon Case Unfolds*

An article in this magazine for October, 1962, indicated that a recent decision of the Federal Power Commission's Presiding Examiner in the Marble Canyon Dam hearings of the past year rec-

*(Continued on page 21)*



# *News Briefs from the Conservation World*

### Acreage Added To Maine Wilderness Park

This magazine for December, 1961, carried a major article on one of the finest and most unusual State Parks in the nation—Baxter State Park, in the Katahdin Mountain wilderness of north-central Maine, given to the people of that State by a former governor, Honorable Percival P. Baxter of Portland.

As stated in the article the area of Baxter Park was 193,254 acres. Recently *National Parks Magazine* has learned that Governor Baxter has been able to add another 7764 acres to the park, and has attained his goal of a great 200,000-acre wilderness preservation for the enjoyment of the people, "forever to be left in its natural wild state." Actual acreage is now 201,018.

Baxter Park does not fall under the jurisdiction of the State Park Commission, as do other Maine State parks. Rather it is administered by the Baxter State Park Authority, composed of the Governor of Maine, the Forest Commissioner, the Commissioner of Inland Fisheries and Game, and two residents of the State, one of whom must be a resident of Greenville or Millinocket.

### Desirable Area Donated As Texas State Park

The possibility of an unusually fine addition to the Texas State Park system has been under discussion during the past summer, according to *S-Parks,* publication of the Texas State Park Board. The publication has announced the proposed gifts, by its owners, of the 4778-acre Circle Bar Ranch in Blanco County, 36 miles west of Austin, as a future State park.

The huge ranch is owned by Mr. and Mrs. C. A. Wheatley of San Antonio, and is comprised for the most part of hilly land heavily clothed with trees and shrubs, with deep and beautiful canyons. The property fronts for some ten miles on the Pedernales River, which forms a series of falls and rapids on a portion of the area, and which in other reaches offers calm waters and sandy beaches.

"The varied topography creates a natural wildlife habitat," says the Texas park publication, adding that deer, wild turkey, coyotes, bobcats, and many smaller animals are abundant.

As a condition of the gift, $250,000 must be raised for certain developments for public recreation; the State Park Board has indicated, however, that "vast areas within the park would be left in their present semi-primitive state."

Both Mr. and Mrs. Wheatley have long been interested in wildlife and the out-of-doors, it is indicated; Mr. Wheatley was the first president of the Izaak Walton League in Texas, and has represented that State in numerous national councils on wildlife management.

### Possible New Edition Of Big U. S. Map

One of the indispensable maps of the school classroom—the Geological Survey's famous official wall map of the United States—will be headed toward a new printing if Congress complies with a recent request of the Department of the Interior. The big map, first edition of which went to press in 1880, was last printed in 1953, and supplies of that edition are now nearly exhausted, according to the Department.

The map, in nine colors, details States, cities and towns, rivers, national parks and monuments, national forests, Indian reservations, public surveys, national wildlife refuges, and reclamation projects. It also records the Louisiana Purchase, the Texas Annexation, and other steps in the growth of the nation.

### Sierra Club Workers In Back-Country Cleanup

During the latter part of August, a group of dedicated volunteers spent vacation time on a "citizen conservation corps" project in Yosemite National Park under sponsorship of the Sierra Club, West Coast conservation organization with headquarters in San Francisco. Hiking down the John Muir Trail from the 11,000-foot Vogelsang Pass region, the workers made an end-of-the-summer effort to restore some of the wilderness quality of hiker and packer camps in the Yosemite back country.

Men and women from various walks of life united in a clean-up which netted more than two tons of assorted junk—tin cans, foil, and glass—while boxes and shelves were pried from camp-side trees and inappropriate fireplaces destroyed.

The 1962 conservation project continues the Sierra Club's recent yearly outings against camp litter in the Sierra. Past trips into the Mount Whitney area, Big Pine Lakes of Inyo National Forest, and Bullfrog Lake in Sequoia-Kings Canyon National Parks resulted in the removal of more than 15 tons of cans and rubbish. Project leader Fred Eissler of Santa Barbara has called for "a broadly expanded volunteer citizen conservation corps with individual recreationists and work groups . . . responsible for helping State and Federal land agencies protect the nation's scenic resources."

### Billionth Park Visit Made During August

The National Park Service has announced that the billionth public visit to the lands which have been set aside in a national park system is presumed to have occurred on the afternoon of August 22. The estimate was based on statistical evidence rather than actual figures; and since the exact locale of the billionth visit would necessarily be unknowable most of the 192 areas within the Service's jurisdiction selected a representative "billionth visitor" for a special certificate on that date.

On the occasion of the billionth visit, National Park Service Director Conrad L. Wirth observed that "the national park system has come a long way since the first recorded visit—in 1904, when 120,690 visits were recorded. While it has taken some 58 years to reach the one billionth visit, it is estimated that the second billion will be reached in 11 years—by 1973, and by 1981, in an additional eight years, we estimate that we will record the third billionth visit."

### West Coast Scout Wins Conservation Award

Robert L. Alverts, 18, a Boy Scout who has helped restore trails in the Olympic National Forest and who has given many conservation talks to schools, clubs, and Scout groups, was the 1962 winner of the $500 Dr. James E. West conservation award, given by the Ladies Auxiliary to the Veterans of Foreign Wars.

At the age of 15 the Scout appeared before a Senate committee hearing in support of the Wilderness Bill; he has spoken at a Forest Service hearing on preservation of a wilderness area in Washington State's Cascades, and has helped build trails in the National Park Service Student Conservation Program as well as helping in the restoration of an abandoned pioneer ranch now serving as a museum in Olympic National Park.

Announcement of the award was made at the Auxiliary's national convention, held in conjunction with that of the Veterans of Foreign Wars in Minneapolis during mid-August.


UNUSUAL CAREERS. By Martha E. Munzer. Alfred A. Knopf, Inc., New York City, New York. 1962. 142 pages. Illustrated with black and white drawings. $3.00.

Some of the most significant problems of our age will, it is rightfully asserted in this book, confront the young people of today who choose a career in resource development. A variety of jobs attend each of the four resource fields the author mentions—renewable, non-renewable, "inexhaustible," new and to-be-developed.

Because the specific careers Mrs. Munzer discusses—those of solar scientist, ecologist, research chemist and city and regional planner, to mention but a few—demand considerable technical knowledge, she seeks an audience among pre-high school students. A suggested course of study for high school and college—and much needed encouragement for girls interested in a career in resource development—follows a consideration of the problems already successfully resolved in resource development.

What is there to attract youngsters today to the careers mentioned here? For one thing, there is the idealism attached to any effort dedicated to the welfare of future generations; the expectation that significant achievements may be made. Secondly, the spirit of adventure that accompanies an infant endeavor. In many cases, furthermore, the careers Mrs. Munzer cites could well bring very substantial rewards of the monetary sort.

The teaching of natural resource development and conservation is not listed here, perhaps because it lacks the "drawing card" qualities just mentioned. But let us not forget that it is often a teacher who inspires students to investigate, if not subsequently follow a particular field of inquiry; and inspired and imaginative instruction is an urgent need in the natural resources field.

SKYLAND: THE HEART OF THE SHENANDOAH NATIONAL PARK. By George Freeman Pollock, edited by Stuart E. Brown, Jr. With a foreword by Senator Harry F. Byrd of Virginia. The Chesapeake Book Company. 1960. xv + 283 pages, illustrated profusely in black and white. Available from the Shenandoah Natural History Association, Shenandoah National Park, Luray, Virginia. $3.50 clothbound; $2.50 paperbound.

"Anyone who knows or is interested in the (Shenandoah) Park," writes E. Ray Schaffner, executive secretary of the Shenandoah Natural History Association, "will find this a fascinating account of one of the Blue Ridge's most colorful characters." And in truth, this remark is far from overstatement; George Freeman Pollock was not only colorful and romantic but one of the indomitable forces behind the movement for establishment of a national park in the South Appalachians during the second decade of this century—a man who came to the mountains with the profit motive in his eye and stayed to see the establishment of a national preservation both scenically and botantically remarkable.

WONDERS OF OUR NATIONAL PARKS. By Peter Thomson. Dodd, Mead and Company, 432 Park Avenue South, New York City 16. 1961. 63 pages, illustrated in black and white. $3.00.

Following in the footsteps of his father, sometime superintendent of Yosemite National Park in California's Sierra, the author spent his early summers working with the park crews building trails, surveying roads and stringing telephone wires. For a summer he was a ranger, also in Yellowstone Park in Wyoming. With an intimate knowledge of the national parks, and as their friend, the author has written an excellent introduction to the national park system for young people from ten years upward. In this small volume, which deals actually with only half the parks of the system, the author writes precisely yet imaginatively of the pleasure and inspiration to be found in these great preservations.

FROM THE EAGLE'S WING. By Hildegarde Hoyt Smith. William Morrow and Company, Inc. 425 Park Avenue South, New York City 16. 1962. 287 pages, illustrated in black and white. $3.95.

As an emigrant from the east coast of Scotland and a youngster who had been fascinated by the sight of ships bound for distant ports, ten-year-old John Muir brought with him to America a deep love and respect for Nature and its works. This love remained with him—more often than not as a taskmaster—for the rest of his colorful life.

Beset by the intellectual conflicts common to many talented men, Muir's was not an easy life. His affection for people was seemingly as great as his need for wilderness; yet it was the engagement with the wilderness, in which he matched his strength with nature, that prevented him from succumbing to the loneliness and disappointment which is often the lot of strong believers in causes. In Muir's case, of course, this cause was wilderness preservation.

### MATERIALS FOR TEACHERS

#### Films

THE GRASS-BLADE JUNGLE. Color and sound. 11 minutes. Bailey Films, 6509 De Longpres Avenue, Hollywood 28, California. Rental-sale.

Photographic study of animals and insects found in back yards and vacant lots provides an excellent first lesson in ecology for students of all ages.

CONSERVATION VISTAS. Color and sound. 14½ minutes. U.S.D.A. Motion Picture Service, Washington 25, D.C. Free loan.

Suitable for use at educational conferences, workshops and classes, this film is designed to introduce teachers new to conservation to methods by which children's curiosity and concern in this field may be aroused.

NATURE NEXT DOOR. Color and sound. 28 minutes. The Sierra Club, Mills Tower, San Francisco 4, California. Prepared by Professor Robert C. Stebbins. Purchase price $260.00.

Accompanied by a 24-page illustrated booklet (75¢) explaining the film's scenes, sounds, and narration, this film is well calculated to excite the interest of youngsters in the preservation of particular natural areas around them.

#### Books and Pamphlets

CONCEPTS OF CONSERVATION: A GUIDE TO DISCUSSION. A new and expanded edition of this booklet for both students and adults will be ready for free distribution from the Conservation Foundation, 30 East 40th Street, New York City 16, early in 1963.

TEACHING SCIENCE THROUGH CONSERVATION, by Munzer and Brandwein. McGraw-Hill, New York, 1960. 470 pages, illustrated. $7.50.

For teachers of the sciences—general, earth-sciences, biology, physics and chemistry—this handbook will help supplement classes with experiments, projects and field experiences relating to problems of natural resources and resource conservation.

NATIONAL PARKS MAGAZINE. Second and third educational issues (February and October 1961). Also a film list. National Parks Association, 1300 New Hampshire Avenue, N.W., Washington 6, D.C.



## Your NPA at Work

*(Continued from page 18)*

ommended issuance of a license to the Arizona Power Authority for a dam on the Colorado River a few miles upstream from the northeastern boundary of Grand Canyon National Park. It was pointed out that this decision—which is subject to review by the Commission on appeal—represented an initial success in the campaign for Grand Canyon Park protection, as the plans of the City of Los Angeles, competitor for a Colorado River development license, would if they materialized seriously violate established national park policy.

Since this article was printed a further development has occurred in the Marble Canyon case. On October first, Secretary of the Interior Stewart L. Udall filed a motion with the Federal Power Commission to intervene in the case "out of time," alleging in part that "the rights and interests of the United States which are represented by him now require protection by his intervention. . . ." Mr. Udall stated that these rights could not be adequately protected by any of the parties to the case. As our readers know, the National Parks Association was an intervenor in the Marble Canyon case to present the views of both the National Park Service and park defenders generally.

As one of the reasons for reopening the hearing record Secretary Udall stated in part that "certain witnesses have testified as to the plans and programs of the Department of the Interior so that these important public responsibilities have been presented to the Commission in an erroneous fashion and without due regard to the considered policies and programs of the Secretary. . . ." Mr. Udall also stated in part that issuance of a Marble Canyon dam license to Arizona "would conflict with and obstruct the comprehensive development of the Colorado River system . . . for multiple purposes. . . ." Individual licensing of any single hydroelectric element on the Colorado River in the lower basin would mean, the Secretary stated, sacrifice of its potential contribution to the success of the total plan.

This "total plan," according to the Secretary, is directed to the solution of the water shortage in the area encompassed by the Lower Colorado River Basin and to the provision of additional hydroelectric power to meet the area's power needs.

* * * *

As a sequel to Secretary of the Interior Udall's petition for leave to intervene in the Marble Canyon hearings "out of time," and for the reopening of the hearing record for presentation of evidence, the Arizona Power Authority on October 10th filed an answer and objection to the Secretary's petition and motion. As of presstime, it is not known whether the Federal Power Commission will deny or allow the Secretary's requests.

## An Appraisal

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point where the benefit of the doubt should dictate caution, maturity of judgment, and statesmanship.

Those who have had long contact with Miss Carson know that she is deeply sincere and intellectually honest. She and many other trained biologists are firmly convinced that the present widespread poisoning of our environment is irresponsible and shortsighted, and that national disaster will be inevitable unless a wiser course is followed. It is well to remember that great progress is made only by those who have deep convictions and who dare to express them. Lincoln observed that "the sin of silence when they should be heard makes cowards out of men." All reformers, political, scientific, religious or financial, have been accused of being fanatics, "crackpots," or of spreading mere "fiction."

We have reached the crossroad. Will we follow the path of sanity, peace, and security, or follow the philosophy which says that "we haven't died yet," and, therefore, that all is well? ■

*Ranger naturalist and group on nature walk at Glacier Point, Yosemite National Park*

*Robert N. McIntyre, National Park Service*

AMONG THE COUNTRY'S vital resources are the youngsters who will be tomorrow's conservationists and preservationists. The richness of their lives will be measured, however, by the success of today's conservation education.

AS A LEADING American conservation organization the National Parks Association is deeply concerned with the kind of future our youngsters will inherit. Through the pages of *National Parks Magazine*, they will be introduced to the conservation issues of both present and future, including those which directly or indirectly affect our great national park system. With Christmas in mind, you might well solve some problems with gift subscriptions to youngsters, schools or libraries, taking advantage of the special educational rate; a card is enclosed in this magazine for your convenience.

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