

NATIONAL PARKS *Magazine*



The Tall-Grass Prairie: A Scene In
Proposed Prairie National Park

February 1962

The Editorial Page

A Water-Gate For Rainbow

It is the intention of Congress that no dam or reservoir constructed under the authorization of this Act shall be within any national park or monument.

The Secretary of the Interior shall take adequate protective measures to preclude impairment of the Rainbow Bridge National Monument.

—Colorado River Storage Act, 1956.

A LETTER, PUBLISHED ELSEWHERE in this issue, from the Reclamation Bureau to this Association giving the schedule for closing Glen Canyon Dam and filling Lake Powell on the Colorado River sets the pace all too clearly for the protection or destruction of Rainbow Bridge National Monument.

Legal counsel and engineering consultants for this Association will be analyzing the letter and related material carefully during the next few months to determine the date at which injunction proceedings must be instituted to defer the contemplated closure unless and until protection is accorded.

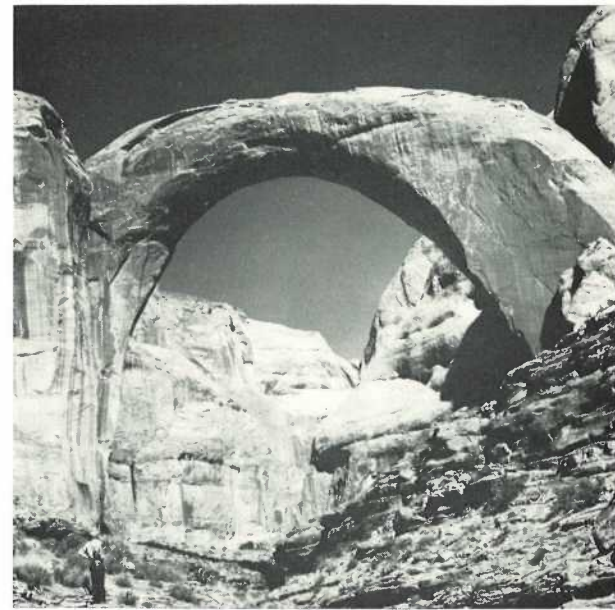
Most conservationists would still hope for a more seemly solution to this controversy than litigation interrupting a \$325 million electric power and irrigation project. They would prefer that protection be provided to the Monument either by stabilizing the level of Lake Powell permanently below the Monument boundary or by constructing a barrier dam on Bridge Creek or Aztec Creek. Protection is the important thing; the method is relatively unimportant.

On written record are quite a few members of Congress who believe that the good faith of Congress is involved in providing the necessary appropriations to implement the guarantees of protection which are quoted above. Most conservationists agree with this view.

Conservationists have not forgotten, and they are not likely soon to forget, the honorable and public agreement whereby they withdrew their objections to the Upper Colorado Storage Act just a few years ago after assurances that these guarantees would be inserted in the law.

The issue is not whether someone thinks or does not think that water under the Bridge will impair the Bridge or the Monument; the issue is the guarantees which were given and accepted in good faith that reservoir water would never enter the Monument.

Nor is money the issue, because big money is not involved. Estimates of the cost for protecting Rainbow have ranged from \$3.5 million to \$35 million. There is some reason to believe that the real cost might be about \$10 million. This is a trivial expenditure compared to the cost of Glen Canyon Dam, and the amounts being thrown away annually on useless cloverleaves, extravagant highways, urban demolition, and on reclamation projects bringing more land into surplus cultivation.



Bureau of Reclamation

The issue is the established national policy for the protection of our parks and monuments against dams and reservoirs, and the integrity of the entire national park system.

There could be a pleasant ending to this unhappy story. An earth-core, rock-fill barrier dam at Site C on Aztec Creek, some four miles below Rainbow Bridge, would provide effective and not unsightly protection against reservoir waters rising into the Monument. A simple and inexpensive pumping system would lift the normally slight flow of Bridge and Aztec Creeks over the dam into the reservoir. Visitors would travel across the reservoir by boat and along easy foot trails over the dam and up the canyons, which are verdant in springtime and profoundly beautiful, to the ancient and magnificent bridge itself.

Thus we can create, if we have the imagination and the will as a nation, a lovely Water-Gate to one of our world-famous national shrines.

Indeed, such a Water-Gate to Rainbow could be the entrance to a spectacular new national park, the boundary to lie upstream from the pool behind the barrier dam, if the Navajo Tribe assents, and Congress so decides.

The alternative, if events continue in their present dreary course, will be a zone of reservoir fluctuation reaching up the canyons and under the Bridge, filled with quicksands and tangled masses of tamarisk, an ugly memorial to the contempt of the self-styled developers for the values for which the park system stands.

As we go to press, we learn that Interior Secretary Udall has recommended to the President inclusion of an appropriation for Rainbow in the Public Works Appropriation Bill; most conservationists will applaud this recommendation. Soon we shall know whether the Budget Bureau has interfered and whether the President supports the appropriation. As observers and reporters we shall follow subsequent developments in subcommittee, in committee, and on the floor of both Houses with keen interest and shall keep our readers informed. —A.W.S.

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**NATIONAL PARKS Magazine**
OFFICIAL PUBLICATION OF THE NATIONAL PARKS ASSOCIATION

FEBRUARY 1962

Vol. 36, No. 173

Paul M. Tilden, Editor

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THE FEBRUARY FRONT COVER

Panorama in the Proposed Prairie National Park

A Photograph by Jack E. Boucher,

Courtesy of the National Park Service

THE NATIONAL PARKS AND YOU

Few people realize that ever since the first national parks and monuments were established, various commercial interests have been trying to invade them for personal gain. The national parks and monuments were not intended for such purposes. They are established as inviolate nature sanctuaries to permanently preserve outstanding examples of the once primeval continent, with no marring of landscapes except for reasonable access by road and trail, and facilities for visitor comfort. The Association, since its founding in 1919, has worked to create an ever-growing informed public on this matter in defense of the parks.

The Board of Trustees urges you to help protect this magnificent national heritage by joining forces with the Association now. As a member you will be kept informed, through *National Parks Magazine*, on current threats and other park matters.

Dues are \$5 annual, \$8 supporting, \$15 sustaining, \$25 contributing, \$150 life with no further dues, and \$1000 patron with no further dues. Contributions and bequests are also needed to help carry on this park protection work. Dues in excess of \$5 and contributions are deductible from your federal taxable income, and bequests are deductible for federal estate tax purposes. As an organization receiving such gifts, the Association is precluded by relevant laws and regulations from advocating or opposing legislation to any substantial extent; insofar as our authors may touch on legislation, they write as individuals. Send your check today, or write for further information, to National Parks Association, 1300 New Hampshire Ave., N.W., Washington 6, D.C.

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The Prairie National Park

By E. Raymond Hall

Photographs by Jack E. Boucher,
courtesy of the National Park Service

THE AUTHORIZATION OF A TALL-grass prairie national park in 1962 is expected by a growing number of responsible and influential people.

Geographically (see Figure 1, page 6), that magnificent grassland lay between the eastern forests and the Great Plains. The deep, dark, rich soil and twenty-five to thirty-eight inches of annual precipitation early attracted settlers who operated the plow and developed the breadbasket of a growing nation.

Thirty years ago Professor Victor E. Shelford of ecological renown was pleading for the preservation of an adequate sample of the Great North American Prairie. Twenty-five years ago Mr. Victor H. Cahalane, then an official of the National Park Service, was pointing out particular areas of prairie of all types that could be saved. Eight years ago I was recommending establishment of two prairie areas, one of short grass on the Great Plains and one of tall grass farther east. Six years ago the late Professor F. W. Albertson, the cattlemen's grass expert, was commissioned by the Park Service to study several such prairie areas. Four years ago Professor Gerald W. Tomaneck of Fort Hays Kansas State College was employed by the National Park Service to study remaining areas of tall grass. As a result of all these studies Director of the National Park Service Conrad L. Wirth, with the approval of the National Parks Advisory Board, design-

nated one of those areas—the Pottawatomie Area in Kansas—as the most feasible. Shortly thereafter, the Honorable Andrew F. Schoepel and the Honorable Frank Carlson introduced a bill in the United States Senate, and the Honorable William H. Avery introduced a companion bill in the House of Representatives, to establish a national park in Pottawatomie County, Kansas. Those bills in the last session of the 86th Congress were S. 73 and H.R. 4885, and they were again introduced by the same sponsors, and under the same numbers, in the first session of the 87th Congress.

Tall-Grass Prairie Not Represented

The Congress has seen to it that samples of most of the major types of flora in the United States have been preserved, for instance, big trees (Sequoias) in California, Everglades in Florida, and eastern hardwood forest in the Great Smokies of Tennessee. But no representative sample of tall-grass prairie has been set aside. In that vast region of more than four hundred thousand square miles supporting tall-grass prairie, where more than twenty-two million people live today, some samples fortunately remain—notably in the Flint Hills area extending from north to south across eastern Kansas. The pieces of flint in the soil of those hills were used by Indians for making arrow points, but the flint also discouraged the white settlers bent on plowing up

the land. For eighty years this bluestem country has been devoted to cattle grazing. The tall-grass prairie there, as it was elsewhere, is made up of more than a hundred species of plants. Conspicuous grasses are Indian grass, switch grass, and big bluestem—the last so tall on aerated, well-drained lowlands as to conceal a horse and all but the head of its rider. On the upland, little bluestem and dropseed are common, and sideoats gramma clothes many slopes. On especially well-drained crests, blue gramma and even buffalo-grass can be found, although these two are characteristic of the more western short-grass prairies where rainfall is slight.

Prairie flowers are varied in color and unexcelled in beauty. Downy prairie phlox and windflower appear in early spring. Verbenas, black-eyed susan, and wild indigo bloom later, and tall gayfeather, coneflowers, sunflowers, and the chest-high compass plant carry beauty on into autumn. Every child raised on the prairie knows that exuded sap in waxy droplets on stems of the compass plant makes good chewing-gum, and that its leaves have their edges north and south and their flat sides east and west. Wild strawberries, no larger than the end of a person's little finger, are distinctly sweeter than garden varieties.

The fruits, the seeds, and the roots of prairie plants, and the insects that live on those plants, are the principal foods of a variety of animals. Franklin's ground squirrel is one. The thirteen-lined ground squirrel that eats grasshoppers in preference to seeds is another. The coyote and the striped skunk dig out nutritious grubs that overwinter in the rootstocks of the com-

« Unrepresented as yet in the nation's park system is a sample of the tall-grass prairie, which once spread across more than four hundred thousand square miles of land immediately to the east of the Great Plains and which supported its own distinctive communities of plants and animals. Photograph on page opposite was taken in September, 1961, looking southwest from a point in the vicinity of Carnahan Creek, Pottawatomie County, Kansas, within the proposed Prairie National Park.

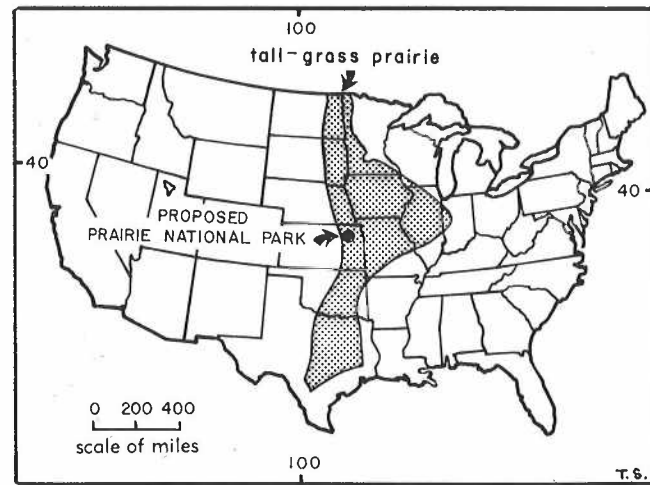


Fig. 1

Figure 1, above, outlines the original tall-grass prairie area of the nation; while figure 2, right, details proposed Prairie National Park in Pottawatomie County, Kansas, and tentative National Park Service plans for a road and trail system.

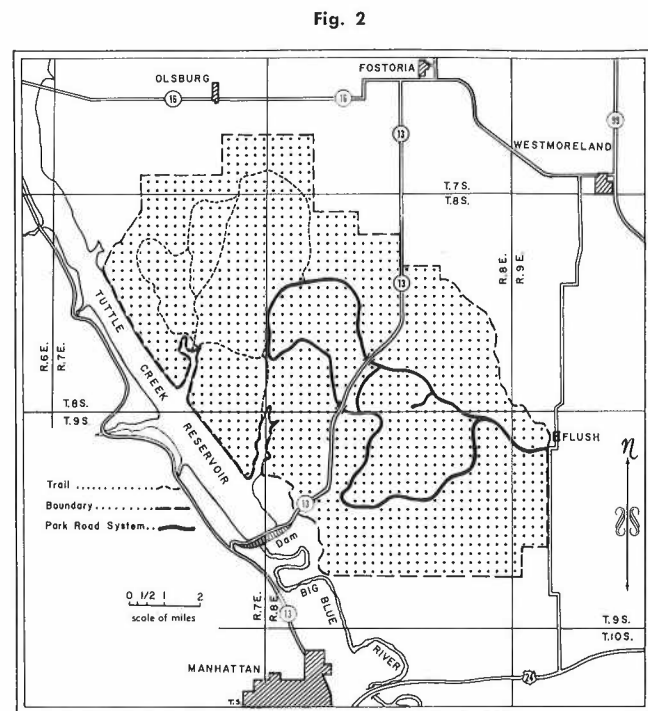


Fig. 2

pass plants. Greater prairie chickens that boom at dawn like distant, rhythmic thunder, and upland plover that raise and almost touch their wings above the back with each heart-stirring whistle are as characteristic of the tall-grass prairie as the bison that ate the grass and the prong-horned antelope that browsed the brushy vegetation.

Large herbivorous mammals native to the area were the bison, prong-horned antelope, elk, and white-tailed deer. All were extirpated, but the last has re-established itself. Plans call for the re-establishment of the first three. For animal enthusiasts the grand spectacle of prairie big game in its natural abundance would be one of the most attractive and significant features of the prairie park. The wolf and mountain lion that tended to regulate numbers of the herbivores probably would not confine themselves to the park, if liberated there, and shortly would be killed by cattlemen, who refuse to tolerate these species among their herds. Therefore, an appropriate percentage of the annual increase among the herbivores in the park must needs be removed each year by artificial means;

otherwise the large herbivores will eat themselves out of house and home.

Overgrazing Is Ruinous

Although the prairie has a remarkably stable ecology—a toughness and resistance to change even in the face of continued drought and recurring prairie fire—it yields to prolonged overgrazing. Proof of this I saw last summer while visiting one quarter-section never cut by a plow, but long overgrazed by cattle. Exotic weeds, bare ground, and thickets of osage orange (non-native to the area) had replaced the prairie grass that I helped my father cut for hay fifty years ago. The strawberries were gone, the compass plants were gone, and so were the prairie chicken, upland plover and thirteen-lined spermophiles. At the edge of the tract below the cap-rock outcrops each of the three permanent springs at which

Dr. Hall, long-time advocate of a tall-grass prairie park, is presently Director of the Museum of Natural History, The University of Kansas.

we had quenched our thirst was dry. Rains now run off on the surface instead of sinking into the fibrous cushion of the prairie sod. Continued overgrazing just as completely ruined this prairie in fifty years (or less) as plowing it up in two successive years would have.

A recent visit to another tract, where only seventeen years ago I saw men cutting prairie hay, was instructive. Because the area since then never was mowed, grazed or burned, it now is woodland. Some box elders and American elms are forty feet tall. Prairie fires of old, started by lightning or set by Indians in order to dislodge deer, cut short the life of woody plants and preserved the tall-grass prairie. But, these fires were characteristic of late summer, autumn, or winter, and did not burn over every area every year. Where ranchers now burn all of their prairie each spring the shrubs are killed, and also the cattle can reach the new, green grass in spring a few days earlier than otherwise; but the young prairie chickens are killed and the nests containing eggs yet unhatched are destroyed. The prairie chickens are

thought not to nest a second time in the year in which their first trial at nesting is unsuccessful. That species and many others, for want of cover in spring, are extirpated by spring burning of the prairie. Burning in spring preserves a flora minus its fauna. In the Park, prairie fire in proper season, staggered by areas and by years, will be necessary to preserve the tall-grass prairie.

The best reason, to my mind, for preserving a sample of tall-grass prairie is to make its beauty available to all persons. I hope that they will be able to smell, taste, touch and hear, as well as see, the prairie. Furthermore, a sample will be recurrently useful to the soil scientist, hydrologist, biologist, and other investigators as an outdoor laboratory for scientific research, which means a laboratory area for practical study and understanding of the effects of native plants and animals upon the soil and on each other. If preserved in its natural state, this area will become

a yardstick for measuring effects on our land of cultivation of crops and grazing of domestic livestock, and will point out for mankind the road to a better life. It is important that Kansas State University, with its progressive agricultural curriculum and plans for 15,000 students in 1970, is only four miles from the proposed park.

Planning For the Park

Seven by thirteen miles, amounting to 57,000 acres, the proposed park embraces flint hills rising abruptly from the Blue River Valley on the west. The hills become more gently rolling to the north and east. Roads, small in scale—mostly conforming to the topography—will provide a short- and long-loop for motorists (Fig. 2, page 6). The visitor center will be near the head-

quarters area at the eastern boundary where administrative space, utilities, and maintenance facilities, plus residences for year-round employees, will not intrude on the park proper. Nearby towns would afford meals, lodgings and other services.

In the park, north and west of the road, trails, short to long, will lead persons on foot or on horseback into the undeveloped remote areas. There visitors will be impressed with the prairie extending unbroken to the skyline in all directions. They will feel the vastness of the prairie so frequently mentioned by early travelers who crossed it—the vastness so much cherished by persons who grew up on the prairie. This feeling of vastness, and its accompanying satisfaction, are closely akin to the enjoyment felt by a moun-

A typical scene within the proposed park shows rolling, grassy uplands, bright with flowering plants in season, sloping gently toward a bottomland with trees and shrubs. The photograph, which was taken during early September, 1961, looks toward the northwest over area of proposed park drained by Carnahan Creek.



tain resident when he pauses to rest on a clear day after reaching the top of a high peak in the Rocky Mountains or the Sierra Nevada.

Every area selected for national park status has presented problems, and the Pottawatomie area has its own. One is, that all of the land is privately owned. A report by Glenn H. Miller, Jr., on the economic results expected from establishment of the park was published in June, 1961, by the Center for Research in Business of The Uni-

versity of Kansas at Lawrence, and shows that a loss of \$60,000 per year in taxes because of land removed from the tax rolls will be offset a hundred times by \$6,000,000 of tourist-spending in the State. A twenty-four-page brochure in color, entitled *A Proposed Prairie National Park*, was released by the U.S. Department of the Interior, National Park Service, in August, 1961, and reveals the tremendous esthetic values of the proposed park. These two reports have done much to widen the

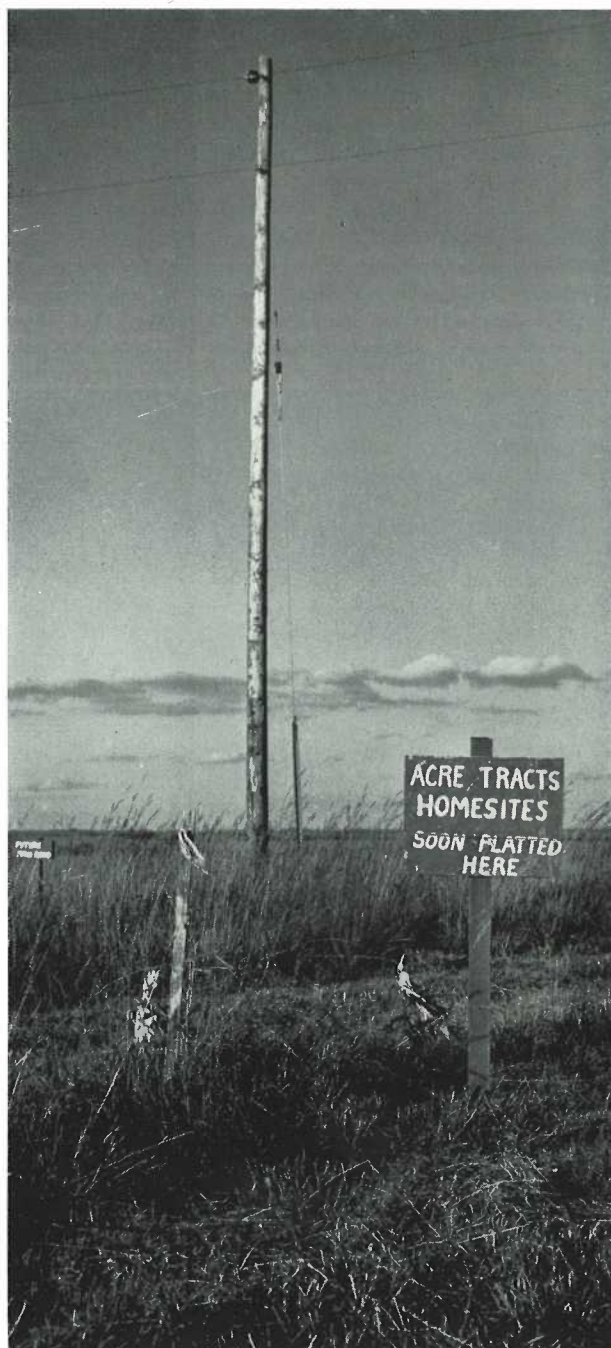
base of local support for such a park.

A step toward acquiring land for the park was the formation, on October 4, 1961, of the Prairie National Park Natural History Association, of which Mr. L. B. Carson, 1306 Lincoln Street, Topeka, Kansas, is secretary and treasurer. Members plan to obtain a charter as a non-profit corporation qualified to receive gifts of land, and gifts of cash with which to obtain land, that can be donated to the national park. It is hoped that the Kansas Legislature, upon recommendation of the Governor will find it possible to appropriate some monies to the State Park Authority to use in purchasing land for donation to the National Park Service at an appropriate time. Congress will be asked to appropriate funds to purchase the remaining lands, and to create the Prairie National Park.

The Hour Is Late

In Illinois, some years ago, a bill in the State Legislature to set aside a sample of tall-grass prairie was well on its way to passage when a member asked to inspect some suitable areas. Then it was discovered that the last one in the State had been plowed up several years before!

It is later than we think if an area of tall-grass prairie is to be preserved anywhere. Consider what has happened in the last five years in Kansas. A potential park in Chase County was cut in half by the new Kansas Turnpike. Another fine area in Riley County yielded natural gas; consequently wells, drilling rigs, pipelines and service roads quickly laced that area. Even the proposed park lands in Pottawatomie County have been seriously impaired in the last three years. Seven miles of Kansas State Highway 13 were cut diagonally through the grassland. Its western margin is disappearing under water rising in the Blue River Valley behind the just-completed Tuttle Creek Dam for flood control. If ranchers inconvenienced by inundation of their outlet roads to the west force the U.S. Army Engineers to construct the miles of promised new access roads before Congress can create the park, this Pottawatomie area, too, will have gone the way of other prairie areas. Time is running out. ■



Remaining samples of tall-grass prairie suitable for park purposes are few, and even for the relatively unspoiled area described in this article the hour is late. The photograph at left was taken within the proposed preservation in September, 1961. View northward from a point near the Tuttle Creek Reservoir in northwestern part of the park.

Some strange plants flourish in Arizona's

Desert Botanical Garden

By Ida Smith

Photographs by Moulton B. Smith

IF YOU WOULD LIKE TO SEE AND study the flora of the world's deserts in a single trip you should visit Arizona's Desert Botanical Garden, near Phoenix. In this remarkable garden of one hundred and fifty acres, thousands of rare and curious plants from the deserts of the world are carefully preserved. An enthusiastic staff, headed by Director W. Hubert Earle, stands ready to answer the questions asked by the thousands who visit the Garden each year. In addition, classes are held on desert cactuses, wildflowers, trees, shrubs, and birds and other animals.

One of the questions asked several times a week is: "What is chaparral?"

"Chaparral," says Hubert Earle, "is comprised of all plants that grow in thickets and have spines or spiny leaves. The 'chaps' worn by cowboys to protect them when riding got their name from the word chaparral."

In the Desert Botanical Garden some fifty-nine plants are labeled to provide a self-conducted nature walk. Among these are several species of barrel cactuses, one of which has been much overpublicized as a source of water. "This plant actually dehydrates in summer," say the Garden's experts. "What sap it has is sticky and acrid. The fruit of

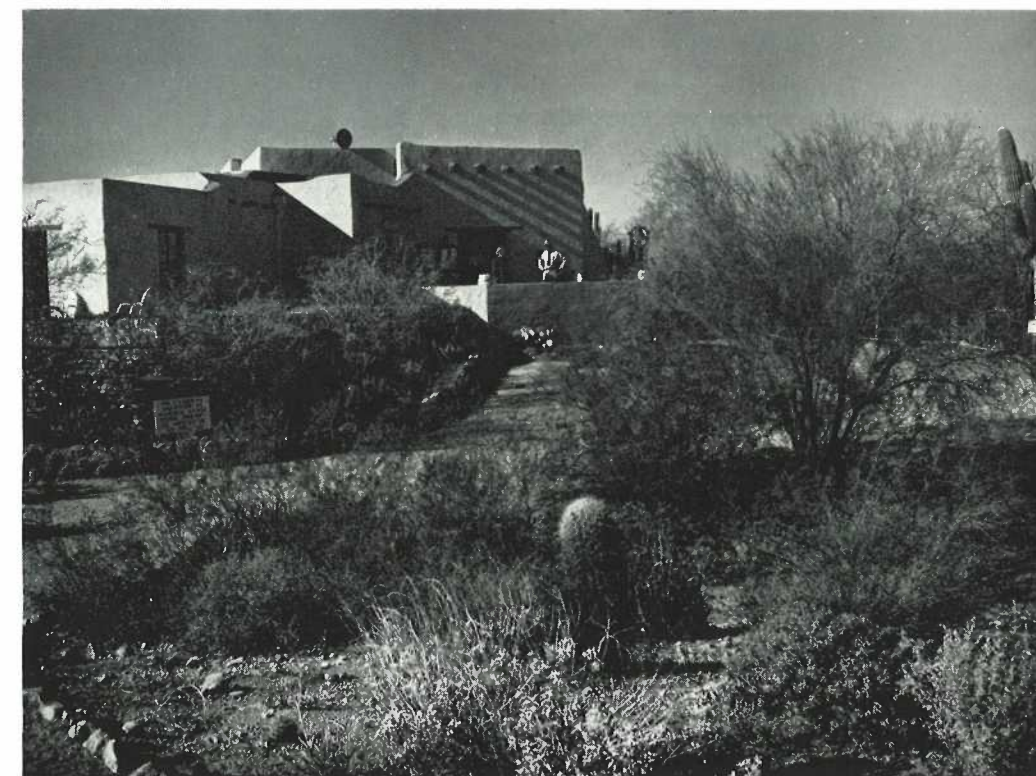
the prickly pear furnishes by far the more refreshing juice."

The cactus family is native to the Americas, with a few botanically questionable exceptions. Specimens found in other countries have without exception been transplanted. But plants of other families growing in other deserts of the world have adopted the same methods of drought-survival as have those of the cactus family of the Americas. Therein lies a fantastic field for exploration. In developing similar mechanisms for storing and conserving water, such plants have come to bear a remarkable resemblance to the plants

of our cactus family. "Some of them look more like cactus than cactus!" exclaimed one observer, humorously.

One of the most striking examples of "parallelism" is found in the South African spurge, which resembles our cholla cactus. It is said that some South African milkweeds and one species of wild geranium are developing a cactus-like appearance. An aloe from South Africa resembles a Mexican agave, or century plant. The crown of thorns, with its bright red flowers, grows branches that look like those of our ocotillo.

There are many other strange doings



The Desert Botanical Garden's administration building, at the right, houses a museum, research library, herbarium of 3500 specimens, offices, and the Webster Auditorium, where weekly illustrated lectures on plants of the desert are presented.

in this green world of plants. One may see marigolds from South Africa which so closely resemble the little pebbles among which they grow that one must look twice to make sure which is which. An aloe in the Garden—a member of the lily family—blossoms during our winter.

But to go back to the subject of drought-survival adaptations. One of the most intriguing plants in the Garden is a pereskia from the West Indies which represents the first transition from the rose to the cactus. Its transition was apparently arrested when earth movements failed to transform its surrounding into a completely arid desert.

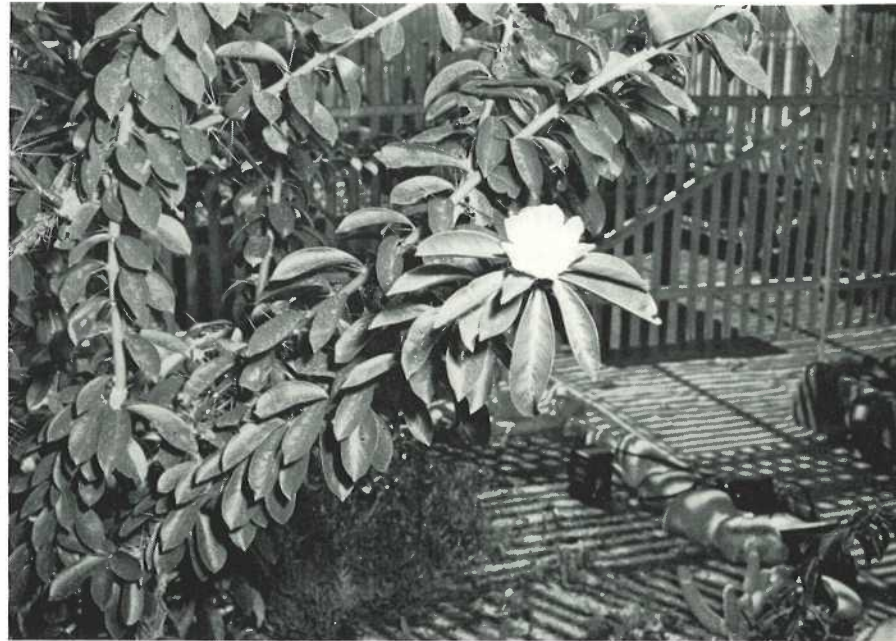
Tiny wild desert flowers grow hairy leaves, while others have developed waxy leaves to prevent evaporation. Among numerous other clever adaptations to life in the desert are: leaf reduction; arrangement to reduce surface area, thereby lessening evaporation; and accordion-like ribs that expand in wet seasons and shrink in dry. These, and many other changes in form, have occurred in plants that have successfully adapted themselves to increasingly arid climates. It has been said that if one needs proof of Providential guidance, one need look no farther than the plant world to find it.

Esthetic Education Needed

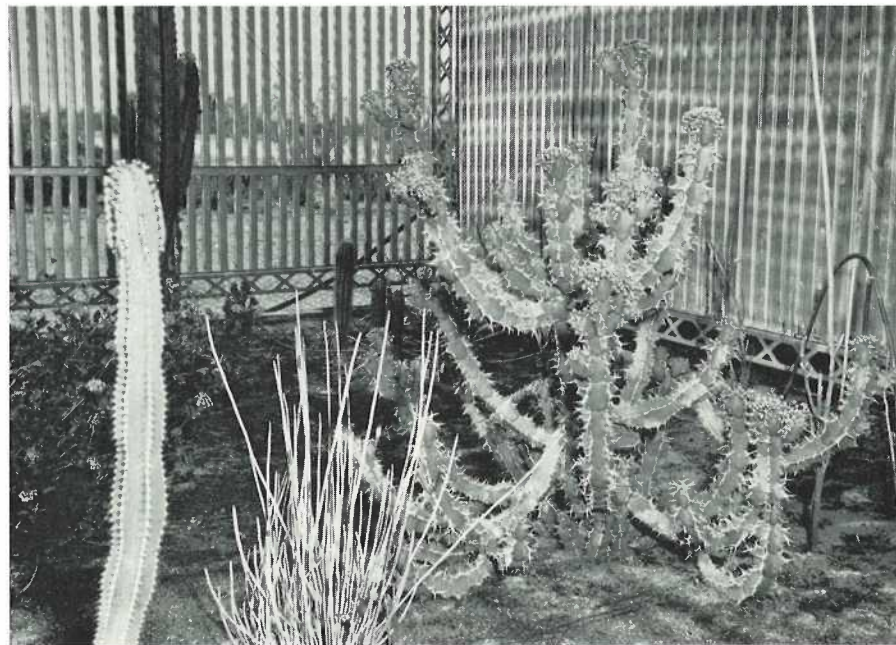
Thoughtful observation on the part of the American public might go a long way toward lessening the needless and foolish destruction of plant life. It takes sixty years, for example, for a barrel cactus to grow to a size sufficient to make twenty pounds of cactus candy. It would not be so tragic if the candy-makers would grow their own barrel cactuses!

An automobile that knocks down a large saguaro has destroyed in a moment the slow and marvelous growth of two hundred or more years. Both juveniles and adults have been observed in this practice on the desert outside the Garden.

"The most expensive factor in the operation of a garden such as ours," said the late W. Taylor Marshall, former Garden director, "is the effort to protect our plants against vandalism by the general public." Mr. Marshall had immediate reference to a huge



Among the strange plants of the Garden are a pereskia from the West Indies, transitional between the rose and the cactus (above) and a South African spurge (below) which shows some of the characteristics of the cholla cactus of our own southwestern desert country.



saguaro in the Garden that had been cut with a knife. It was wintertime, and because of damp weather the saguaro had been unable to heal itself. Infection set in, and destroyed a forty-foot, two-hundred-year-old cactus.

Arizona's plant protection law covers a large variety of cactuses and other

desert plants. Each violation of the law may result in a fine of up to \$300, but it is a sad fact that relatively few know about the law and the reasons for it.

The Desert Botanical Garden was originated by the late Gustaf Starck, of Scottsdale, Arizona. Mrs. Gertrude Webster, before her death, contributed

her own money and influence to develop it. The administration building, named for her, was erected in 1939-1940.

The Arizona Cactus and Native Flora Society was formed and incorporated in 1937 to sponsor the Garden, started in 1938. Today there are six-hundred fifty-six members.

George Lindsay, first director, was succeeded by Charles B. Flemming when Lindsay went into the service in 1940. For a period during the war the Garden was closed. After the war, W. Taylor Marshall became director and served from 1947 until his death in 1957, carrying on the educational and improvement programs.

W. Hubert Earle, who joined the staff in 1947, succeeded Mr. Marshall, and under his direction the Garden has expanded considerably more. A new Visitors' Reception Building has been erected, new plantings have been made, and more classes added to accommodate the numerous visitors.

Classes are held every Wednesday afternoon from November through May, and illustrated lectures every Thursday evening. The fourteenth annual Cactus Show—sponsored by the Garden and the *Phoenix Gazette*—was held in February, 1961, at which time Governor Paul Fannin dedicated the new Visitors' Reception Building.

A Busy Director

Director Earle's daily schedule is a busy one. His lectures on desert plants, illustrated with his own color slides, are in great demand all over the State: in schools, service clubs, garden clubs, and science groups. His lecture, "Arizona Flora and Fauna," is presented to schools under the auspices of the Traveling Science Institute of the Arizona Academy of Science, and is sponsored by the National Science Foundation.

Mr. Earle is editor of *Saguaro* and *Bulletin*, the official publication of the

Garden. He contributes to botanical magazines all over the world, and to cactus-club magazines. He is also author of an important article on edible desert plants in the booklet *Desert Survival*, published by the local Civil Defense chapter; and the section on desert planting in *Practical Gardening*, sponsored by the local Valley Garden Center. His new book, *Cacti of the Southwest*, is scheduled for early publication.

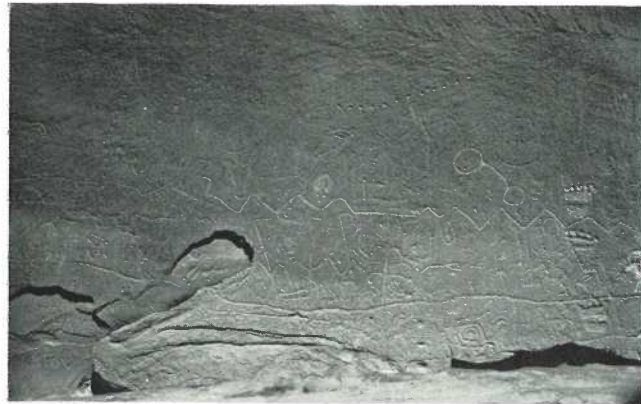
Hubert Earle has an unusual hobby. While his friends are collecting cactus plants, Earle collects and distributes cactus seeds, in addition to growing them in the Garden.

"We are expanding the Garden yearly," he says, "to facilitate the increasing number of visitors. Last year over 135,000 persons, many from foreign lands, viewed the thousands of desert plants imported from deserts throughout the world." ■

THE PATIO AT RAINLIGHT

*The patio at rainlight silvers me,
It swings and sings and storms along
with rain,
Black honey falls upon its wings and
webs
The shadows in the patio with light.
It is a roof, a roof over my head,
I watch from here the birds of beauty
come—
I watch the day slip into hills of
storm . . .
I see the lonely one walk up the street.
The patio at rainlight is my friend.
The patio sits still like a cat haunched
Against the world of rain and hides its
paws.
Drip down, drop down, sing down, you
singing rain,
You soft and stealthy rain that pearls
the lawn—
As I sit sheltered here in the rainlight.*

—Marion Schoeberlein



The petroglyphs of prehistoric Indians adorn the cliffs of Capitol Reef Monument in many places, some still showing original colors.

AS THE HEART OF A GEOLOGICAL wonderland of the American West, Capitol Reef National Monument includes a 33,000-acre segment of the famous "Waterpocket Fold"—a great earth-wrinkle of some sixty millions of years ago—that angles for a hundred and fifty miles across south-central Utah. Here the once-level layers of the earth's outer crust have been tilted to form a vast, eastward-sloping plain.

Shearing the western flank of the uplift, the Thousand Lakes fault—a great crack in the rock layers of the region, along which displacement has occurred—has created a spectacular escarpment 1000 to 2000 feet high which is horizontally banded with exposed cross-sections of intensely-colored rock layers—truly, a rainbow lying down. The northern portion of this cliff face is called the Fluted Wall. South of it is Capitol Reef, so named by the early geologists in allusion to its reef-like aspect.

The unusual name of the great earth-fold, of which Capitol Reef is a part, stems from the occasional potholes that have been ground out of the sandstone by erosion, and by running water in the gorges, which retain precious—if not always fresh-tasting—water for considerable periods of time.

Since the major drainage channels of the region apparently antedated the gradual uplift, watercourses do not follow the base of the cliff, but rather cut directly through the reef and the east-

sloping plateau behind it to form deep, narrow, twisting, sheer-walled canyons. Over the ages the erosive forces of wind, rain and chemical solution have been constantly working to expose the rock layers of the cliffs, and have produced carved stone figures that range from tiny, delicate sculptures resembling animals and men to huge rounded turrets of white sandstone that rise like capitol domes against the deep blue Utah sky. When the sun is at the proper angle, some of the domes reflect a yellow glow, as though they were actually mantled with a layer of leaf-gold.

Hikers' Scenic Route

The Fremont River, largest of the streams penetrating the "reef," has chiseled a deep, meandering chasm which, with several tributary gorges, forms a labyrinth of twisting canyons. Among these, Grand Wash is especially impressive, and it provides a scenic hiking route that penetrates a wilderness of cliffs, rifts, and fissures hidden behind the imposing face of the reef.

From the quiet little settlement of Fruita, at the head of Fremont Gorge, a three-mile trail leads the visitor a

short distance downstream and then, by gentle switchbacks, up the north wall of the canyon to a tributary watercourse. At the upper end of this latter watercourse is Hickman Natural Bridge, a stone arch with a span of 133 feet rising seventy-two feet above the stream-bed. The route to Hickman Bridge has been developed by the National Park Service as a self-guiding trail, and numbered stakes, which mark features of interest at trailside, correspond with paragraphs in an interpretive leaflet that may be secured at monument headquarters. Longer hikes—some over primitive trails, others along the sandy beds of dry streams—lead to natural features like Doubting Castle and the Golden Throne.

Because of distance from human settlement and the forbidding nature of the Waterpocket Fold country, the Capitol Reef region was among the last in Utah to be explored and settled. Not until 1957 was Utah State Route 24—the approach road from the west—paved to Fruita, about a mile beyond the monument's small headquarters building. Unable to penetrate the reef at Fruita, the road, now minus paving, turns sharply south to follow the base of the painted cliffs for eight scenic miles. Then it descends abruptly into Capitol Wash, where it enters the cliff-girt portals of Capitol Gorge.

Around the year 1880, pioneer Cutler Behunin followed Capitol Wash

»

Looking north along the face of Capitol Reef, in the Wayne Wonderland of south-central Utah, the various brilliantly-colored sedimentary rock strata involved in the earth movement that created the 150-mile-long "Waterpocket Fold" are seen, bared by ages of erosion, sloping gently away to the east. The light-colored layer that caps the cliff is the Navajo sandstone which, dissected by erosion, has produced the dome-like forms that early inspired a name for the long, colorful mass.

LAND OF THE PAINTED CLIFFS

By Natt N. Dodge

Photographs by courtesy the National Park Service

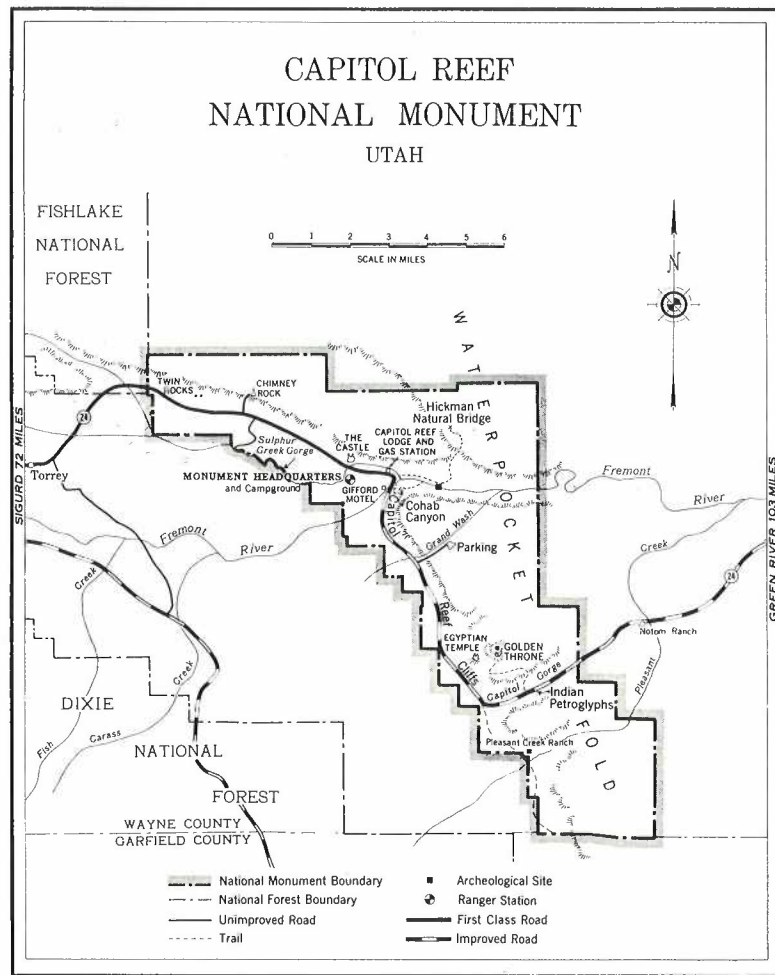
and, building road as he went, forced a way for his team and wagon. It took him eight days to cover the three and a half miles. Even today, the Capitol Wash route offers the only passage for vehicles in the entire 150-mile length of the Waterpocket Fold. A mere sheer-walled slit, its nearly perpendicular

sides are 1000 feet high in some places. At certain points Capitol Gorge is so narrow that two automobiles cannot pass one another. Following cloud-bursts, this imprisoned roadway—one of America's strangest thoroughfares—becomes the channel for a raging torrent. After such storms the route is

impassable until boulders are cleared from the watercourse, and the holes gouged by the flood-waters are filled.

One particularly smooth spot on a wall of Capitol Gorge—known as the "Pioneer Register"—bears the carved names and dates of travelers who, following Behunin, passed that way





Capitol Reef National Monument, in Wayne County, Utah, may be reached from Sigurd, on U. S. Route 89, by way of State Route 24, which continues on through the area to Green River, 103 miles east of Sigurd. The map to the left, adapted from a Park Service illustration, shows the monument's roads, trails, and interest-points.

during the latter decades of the past century. At several other localities in the monument, cliff faces are covered near their bases with strange petroglyphs, some with the tint of primitive paint still in evidence. Archeologists attribute some of these inscriptions to prehistoric Indians of the Fremont Culture. Excavations in open caves have revealed pottery, stone implements, bone tools, rough fabrics, and other artifacts.

Because of its isolation and rugged terrain, the Capitol Reef region reportedly served as a hideout for persons wanted by the law, or by those desiring to conceal their whereabouts for other reasons. Cohab Canyon, a small gorge which received its name following the days of polygamy in Utah, when men retaining plural wives sought secluded homes, is reached by a short, steep trail leading up a slope just across the Fremont River bridge from Fruita. A log cabin, well hidden in the back country, is known as one

of the retreats used by "Butch" Cassidy and his infamous "Wild Bunch" of horse thieves, train robbers, and bank bandits until "things cooled off" following one of their raids about the turn of the past century.

The Paintbrush of Nature

Although its dominating domes, soaring spires, chaos of chasms, and intricate pattern of erosional sculpture make Capitol Reef one of the majestic spectacles of the West, its striking feature is color; the vibrant, glowing, contrasting color of the rock layers whose exposed edges, one above another, form the steps and terraces of the escarpment; the bands of the horizontal rainbow that paint the cliffs.

Photographers will have a field day at Capitol Reef, for every turn in the road brings different views and colorful new vistas. In late afternoon the shadows cast by the towers, chimneys, and domes create a three-dimensional effect in a wild crescendo of contrast-

ing colors. Of them, the geologist C. E. Dutton wrote, in 1876, that "the colors are such as no pigments can portray. They are deep, rich, and variegated; and so luminous that light seems to flow or shine out of the rock rather than be reflected from it." ■

Associate Director Scoyen Retires From Service

Shortly before presstime, the National Park Service announced the retirement, effective January 7, 1962, of Associate Director Eivind T. Scoyen, most of whose 46-year career in Government Service has been with the National Park Service. Mr. Scoyen, born in Yellowstone Park in 1896, was appointed a park ranger in Yellowstone in 1919 after employment with the U. S. Weather Bureau there; he has served in many field capacities in the park system, and has been associate director of the Service since 1956.

Your National Parks Association at Work

During the past summer, the National Parks Association wrote to Mr. Floyd E. Dominy, commissioner of the Bureau of Reclamation, requesting detailed and specific information on the Bureau's schedule for the closing of the Glen Canyon Dam and the filling of Lake Powell. The fight to save Rainbow Bridge Monument was by no means concluded by the failure of the first session of the 87th Congress to appropriate funds for protective works, and conservationists will renew their efforts to obtain appropriations for such works during the current session of Congress. In the event that no appropriations are made, it may be necessary to seek an injunction in court to prevent the Secretary of the Interior from closing the gates of Glen Canyon Dam until protection has been provided. The schedule for completing the dam and filling the reservoir is therefore of crucial importance. The letter appearing below, signed by the then acting commissioner, Mr. Newcomb B. Bennett, Jr., is the first complete public statement of the Bureau's schedule for accomplishment of the necessary operations, and it would seem to indicate that time has not yet run out for the defenders of Rainbow Bridge and park principle.—Editor.

ANTHONY WAYNE SMITH
Executive Secretary, National Parks Association
Washington, D.C.

October 13, 1961

Our letter of August 30, 1961, advised you that the information on Glen Canyon Dam and Reservoir, which you requested in your letter of August 18, 1961, was being obtained from our field offices. This material has now been received.

The statements that follow are numbered in the order of the questions in your letter. If you find that you need further information on any of these points we will be glad to try to supply it.

1. Closure of the right diversion tunnel gate, which is the first step in the closure process, is scheduled for January 1, 1963.

2. The completion of placement of concrete in the dam is scheduled for October 1, 1963. However, the prime contract for construction of the dam is scheduled for completion on June 4, 1964.

3. The completion of the left bank (east) spillway opening into the left bank diversion tunnel will be performed after the permanent closing of the diversion tunnel upstream from the spillway tunnel junction, as discussed in Question No. 4.

4. The date for the permanent closing of the left bank diversion tunnel above the spillway tunnel junction is dependent upon the filling of the reservoir. Whenever, under the closure process as finally determined, sufficient permanent storage has been obtained to permit substitution of hydraulic capacity of the powerplant turbines for the then required discharge capacity of the left tunnel gates, final closure of these gates and installation of the final plug section in the left diversion tunnel will be accomplished. It is contemplated that regulation of the river at Glen Canyon Dam will thereafter be accomplished by releases through the turbines and through the outlet works.

5. The right diversion tunnel is scheduled for completion and the spillway made operable by August 1, 1963.

6. The capacities of the diversion tunnels are dependent upon the water surface elevation of the reservoir. The diversion tunnels are designed to discharge 143,000 cubic feet per second with reservoir water surface elevation at 3277 feet, which is 23 feet below the top of the contractor's upstream cofferdam. Of this total, 73,000 cubic feet per second would be through the right tunnel and 70,000 cubic feet per second through the left tunnel.

7. The two spillways are identical and each will be capable of discharging 138,000 cubic feet per second at the maximum reservoir water surface elevation of 3711 feet.

8. Three sets of 7- by 10.5-foot outlet gates will be installed in the left diversion tunnel plug to meet downstream require-

ments after the right diversion tunnel is closed and until these requirements can be met through the power facilities and the permanent river outlets. The left diversion tunnel outlet works are capable of discharging 33,000 cubic feet per second at the reservoir water surface elevation of 3566 feet. However, as indicated in the response to Question No. 4, the gates will be plugged and made inoperative prior to the time the spillway connection is made.

9. The rate of flow of the Colorado River varies throughout the year. Historically, the minimum of record was 750 cubic feet per second on December 27, 1924, while the maximum known discharge estimated from high-water marks, was about 300,000 cubic feet per second on July 7, 1884. The annual volume of flow in a 54-year period 1906 to 1959, inclusive, has varied from a minimum of about 4 million acre-feet (year 1934) to a maximum of about 22 million acre-feet (year 1917). With the present level of upstream development, the 54-year average annual volume of runoff is estimated to be about 12,860,000 acre-feet.

10, 11, and 12. The dates when the reservoir level will reach the elevations of the sites on Aztec Creek and Bridge Creek will depend very largely on the volume of runoff which occurs in the years immediately following initial closure of gates at Glen Canyon Dam. Assuming our present schedule of closure and the occurrence of a series of years of average stream flow, it is estimated that the reservoir level will reach the points you mention on about the following dates: Damsite "C" on Aztec Creek, May, 1963; Damsite "B" on Bridge Creek, May, 1964; Downstream boundary of monument, June, 1966.

13. The permanent river outlets have a centerline elevation of 3374 feet. The discharge capacity, with a reservoir elevation of 3490 feet, is 15,000 cubic feet per second. These outlets provide a means of releasing water through the dam. Their use is anticipated: (a) During the filling period, prior to completion of the power units, to assist in meeting downstream water requirements. (b) When the reservoir is full (or anticipated to spill) to assist in passing flood flows in excess of the hydraulic capacity of the power units. (c) For emergency use, if needed, to pass water.

14. The centerline elevation of the penstock intakes is 3470 feet. The amount of water flowing through the penstock inlets at Glen Canyon Dam is dependent upon the head and gate opening of the power units (there will be eight power units in Glen Canyon Powerplant). At the rated head of 440 feet, each unit is capable of discharging 3630 cubic feet per second. At the minimum head of 345 feet, each power unit is capable of discharging 3035 cubic feet per second, with the gates fully open.

15. No contracts have been executed for sale of power to be

(Continued on page 19)

News Briefs From the Conservation World

Oceanography Film Available

The current significance and future developments of oceanography and marine biology are imaginatively presented in a film now being offered by the Interior Department entitled "Deep Frontier—An Introduction to Oceanography." Designed primarily for high school and university science students, the narrated color filmstrip, produced with the assistance of the Bureau of Commercial Fisheries, will be made available without charge of State education departments and institutions of higher learning. Colleges and universities should contact the Fish and Wildlife Service, Department of the Interior, Washington 25, D. C. Secondary school teachers should arrange with their State education departments' audio-visual instructors for free loan of the film.

Mt. Rainier Superintendent Retires From Service

Having been with the National Park Service for thirty-seven years, Preston P. Macy—superintendent of Mount Rainier National Park for ten of them—retired on November 24 of the year just past. His first assignment was to Mount Rainier as a seasonal naturalist, back in 1924. Mr. Macy was Olympic National Park's first superintendent, as well as custodian of the old Mount Olympus National Monument. The Macys are now living in Puyallup, Washington State, and until a new superintendent is named for Mount Rainier, Assistant Superintendent John A. Rutter will be in charge of the park.

Funds Needed For Jungle Animal Relocation

Unless the Florida League for Humane Progress, Inc., can raise sufficient funds to relocate thousands of jungle animals in Surinam, northeastern South America, in the near future, they must perish in the rising waters of the lake that will be formed behind the proposed Afobaka Dam and hydroelectric plant some sixty miles south of Paramaribo. The gates of the dam are scheduled for 1964 closing, and a 600-square-mile lake will begin to form.

Dr. J. Michels, commissioner of the Brokopondo District, has expressed deep concern for the wildlife whose lives are in jeopardy because of the power project, which is being built by the Surinam Aluminum Company—a subsidiary of the Aluminum Company of America—but his primary obligation is to relocate the peo-

ple who live in its vicinity. Admitting that lack of funds is not the only problem—animal overpopulation in available areas of relocation, leading to shortages of natural foods and cover is another—Dr. Michels said that the animals would have to accommodate themselves to shortages in their new habitats; that, as of the present, they will have no chance for life whatsoever.

The League, whose address is P.O. Box 4447, Miami Beach 41, Florida, has announced the receipt of some donations for rescue purposes, but has said that the goal has by no means been reached. It stresses the fact that it is still not too late to take part in this humane effort.

Hurricane Brings Honors To State Park Personnel

During her visit to the American Gulf Coast in September 1961, an obstreperous lady named Carla inadvertently brought honors to the crews and managers of a number of Texas State Parks for their "Texas type response" to her vicious capers. A resolution adopted by the Texas State Parks Board formally recognized the service performed by State park personnel in park areas that received many of the refugees from Hurricane Carla's coastal destruction, and Governor Price Daniel personally awarded citations to the managers of the nine State parks most affected by the inrush of fleeing humanity—a situation that developed into a "massive challenge" to park personnel.

Honored for extraordinary service were Park Managers Albert F. Kucera, of Stephen Austin State Park; J. A. Atkinson, Huntsville State Park; Thurman Williams, Buescher State Park; H. M. Walton, Fort Parker State Park; W. B. Hoskins, Lake Corpus Christi State Park; Billy Joe Smith, Goliad State Park; M. W. Van Norman, Daingerfield State Park; Jake Kaine, Palmetto State Park; and H. B. Light, Bastrop State Park, acting in the absence of G. M. Marbury.

California Audubon Works To Acquire Ranch Lands

According to a recent release from the Audubon Society of America, nationwide conservation organization with headquarters in New York City, the Marin County, California, branch of the Society is currently raising funds to acquire a 507-acre ranch lying adjacent to Bolinas Lagoon, on Marin's Shoreline Highway northwest of Stinson Beach, within a short distance of the proposed Point Reyes National

Seashore. The Canyon Ranch—situated among deciduous woodlands and canyons forested with redwood and Douglas fir—contains the last major rookery of the great blue heron and the American egret in that locality.

The shallow waters and mud flats of the Bolinas Lagoon are frequented by migratory waterfowl and numerous shore birds, and hence are an important part of the Pacific Flyway. The Marin branch of the Society hopes, therefore, that if the ranch can be acquired more than 1000 acres of the lagoon will be set aside as a sanctuary.

Wilderness Trail Protection Aim Of Organization

Are you interested in wilderness camping by trail or canoe? An undefined but increasingly large number of Americans are taking to the remote trails and waterways of the nation every year, and sooner or later this influx will pose the problems: what can be done to help people use the wilderness country remaining without destroying its native beauty? How can young people be better trained in safe and courteous wilderness travel?

These and other problems of the kind will be considered by the new organization known as The Trailsmen, headquarters for which are in Cincinnati, Ohio. The organization's official publication is *The Blaze*, which appears five times a year to keep members in touch with wilderness trail and canoe route problems. Membership in The Trailsmen is \$3.50 a year, including a subscription to *The Blaze* and other communications. A sample copy of the publication and membership information may be obtained from The Trailsmen, 1118 Belvedere Street, Cincinnati 2, Ohio.

Dr. Clarence Cottam Receives Audubon Medal

At the annual banquet of the National Audubon Society in New York City during the latter part of November, 1961, the Audubon Medal—the ninth to be awarded to an outstanding American conservationist since 1946—was presented to Dr. Clarence Cottam, scientist of Sinton, Texas, for "distinguished service in conservation."

Dr. Cottam, who has, over a long career in public and private life, been wildlife biologist and administrator of research programs with the old U. S. Biological Survey, and chief of wildlife research and assistant director of its successor, the

U.S. Fish and Wildlife Service—also been dean of the College of Biology and Agriculture at Brigham Young University, Utah. He is presently director of the Rob and Bessie Welder Wildlife Foundation at Sinton; a vice-president of the Texas Academy of Science; and president of the National Parks Association of Washington, D.C.

Dr. Cottam has been a sharp critic of the wholesale pesticide-spraying programs that have been so much in vogue during recent years, and which have upon occasion proved so disastrous to bird, mammal and fish populations in various areas; and he has often urged the importance of a more scientific approach to the use of such powerful chemicals.

Two Park People Leave For Antarctic

Edward A. Hummel, superintendent of Glacier National Park in Montana, and Luis A. Gastellum, assistant superintendent of Yellowstone National Park in Wyoming-Montana-Idaho, have been sent to the Antarctic as United States representatives accompanying the French and Chilean Relief and Resupply Expeditions, the Department of the Interior reported recently. Both were selected to participate in this year's international program sponsored by the Department of State and administered by the Department of Defense through its United States Antarctic Projects Officer. Hummel and Gastellum, both long-time career employees of the National Park Service, have extensive experience in cold-weather operations in the Department's National Park System.

Interesting Rock Formation Discussed In Paper

For readers of *National Parks Magazine* who are mineralogically or geologically inclined, a recent publication of the Government Printing Office may prove of considerable interest. This is Professional Paper 357 of the United States Geological Survey, dealing with the age, stratigraphy, composition, paleogeography and probable conditions of accumulation of the geologically controversial Chattanooga black shale, widespread sedimentary formation of central Tennessee and parts of neighboring States.

Aside from the geologists, who have never been able to agree on how this rock formation came into being, many other people from various walks of life have been attracted to it. It is no ordinary shale. Point one: it contains enough carbonaceous matter to support combustion, and yields up to ten gallons of oil per ton. Point two: it contains more than the usual traces of the element uranium, in

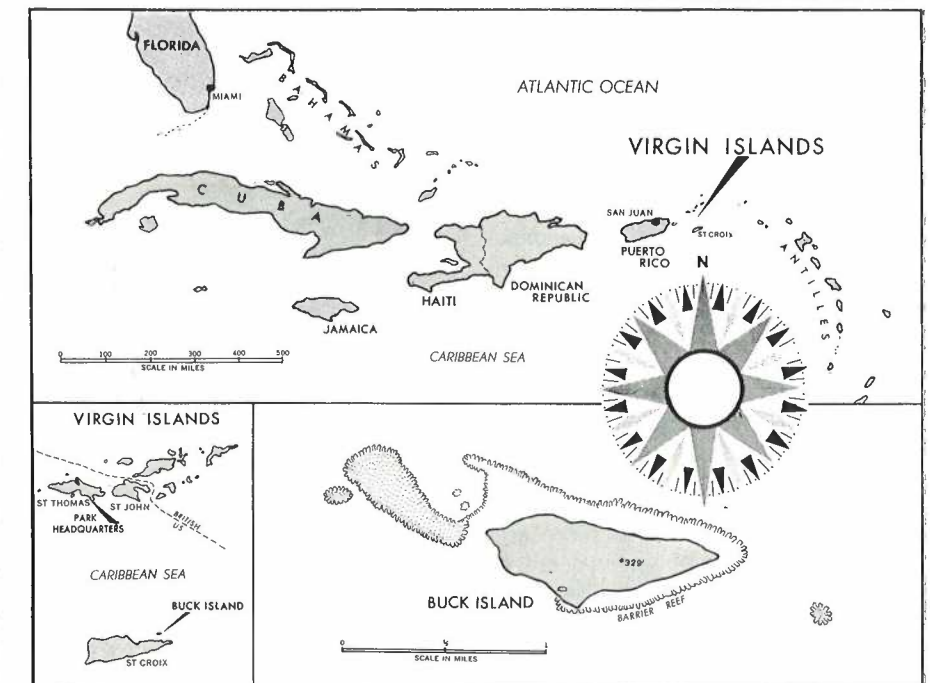
some compound as yet to be identified. Point one has attracted many farmers and prospectors—and their money—with no particular return; point two has intrigued the Atomic Energy Commission, for which geologists L. G. Conant and V. E. Swanson did the professional paper. Aside from the strictly commercial and potentially explosive aspects of the Chattanooga shale, it also carries a fair representation of plant and animal fossils, none of which have so far proved of much value in determining the age of the shale. Copies of Professional Paper 357 may be obtained from the Superintendent of Documents, Washington 25, D.C., for \$2.75 each.

Tiny Tropical Isle Is Newest National Monument

The waning days of 1961 brought a new addition to the national park system with the establishment of Buck Island Reef National Monument, a tiny uninhabited islet in the United States Virgin Islands which is surrounded by a coral barrier reef and shallow waters rich in tropical fish and plant life. The island, which also houses a rookery of the man-of-war bird, is a mile long and has a maximum width of a third of a mile. It lies one and one-half miles off the northeast coast of St. Croix Island in the Virgin group (see map below) and is

The newest national monument of the park system came into being December 29th, 1961, with the acquisition of Buck Island, in the United States Virgin Islands, a small reef-girt islet one and one-half by one-third of a mile in dimension, highest point of which is 329 feet above sea level. Buck Island Reef National Monument has been established to preserve the animal and plant life of a typical coral reef environment of great scientific interest as well as scenic beauty.

Map by courtesy National Park Service





The Editor's Bookshelf

THE LOSS OF PARK AND RECREATION LAND: Where We Stand and What To Do About It. By Donald F. Sinn and George D. Butler. The Research and Education Division, American Institute of Park Executives, Inc., Oglebay Park, Wheeling, West Virginia. 1961. 32 pages in paper cover. Single copies, \$1.00. Discount on quantity orders.

It was one of those queer coincidences which dictated that the reviewer should receive, in the same recent mail, a clipped editorial from the *Minneapolis Morning Tribune*—forwarded by a member of the National Parks Association—and a bulletin from the American Institute of Park Executives, Inc., that echoed an answer to the editorial questions.

The *Tribune* had wondered whether or not scenic Minnehaha Creek west of the city—long admired by tourists, and favorite haunt of wading and picnicking city youngsters—must be sacrificed to the twin gods Suburbia and Speedway, eventually to be stripped by the bulldozers of its trees and meanders and molded into the garden variety of storm sewer. The bulletin, coming next to hand, said in effect: "Yes, statistics show why this open space may well be lost . . . but here is what you Minneapolis folk who care may do to save it."

The bulletin, #9 in the Institute's series of park management aids, is a complete report and analysis of a nationwide survey made "to determine the nature and extent of our loss of park and recreation areas."

It is not, on balance, a pleasant report. Highways, commercial and industrial enterprises, schools and other public buildings have, over the ten-year period just past, eaten up millions of dollars' worth of parks and open spaces. The report gathers together all available information regarding successful encroachments on park lands and open spaces during that time, and tells dispassionately who preempted them, how, and for what purpose.

But there is another side to the coin, too—a rather brighter face. The little volume also details those attempts at park-land encroachment which have *not* been successful over the course of the same period, and analyzes the reasons for failure.

Finally, and not less importantly, the publication lists the steps that park officials and lay citizens may take to minimize the ever-present threats of encroachment. While designed as a "management aid," this is a study report that might well be at the hand of all persons concerned with present and future parks and open spaces—most especially, perhaps, with the permanency of these islands of refuge that dot our spreading seas of tar and concrete. —P. M. T.

WILDERNESS COOKERY. By Bradford Angier. The Stackpole Company, Harrisburg, Pa., 1961. \$3.95. Bradford Angier offers many tantalizing recipes for the wilderness cook, as well as a handy guide to the identification of edible wild foods.

LIVING OFF THE COUNTRY. By Bradford Angier. The Stackpole Company, Harrisburg, Pa. 1956. \$5.00. Nature can provide the food, warmth, shelter and clothing for survival in the wilderness. Although you may not anticipate an emergency on your next wilderness camping trip, you might want to take this volume along—just in case!

HOW TO LIVE IN THE WOODS ON \$10 A WEEK. By Bradford Angier. The Stackpole Company, Harrisburg, Pa. 1959. \$5.00. For those who would, or must, live off the bounty of nature—especially in the latitudes of Alaska and northern Canada. A diversity of information ranging from instructions for building a log cabin to prescriptions for comfortable cold-weather living.

REDWOOD POEMS. By Stanton A. Coblenz. Naturegraph Company, Healdsburg, California. 1961. \$2.50. "Through Wilderness Eyes," the title of one of many luminous poems in this little volume, precisely describes this prolific author's approach to his art. Most enjoyable.

CLASSIFIED ADVERTISING

20¢ per word—minimum \$3. Payment must be enclosed with all orders.

BACKWOODS JOURNAL—Old Forge 10, New York. Camping, hiking, nature, conservation. Illustrated. \$2.00 per year. Sample, 35¢.

CAMP DENALI, MCKINLEY PARK, ALASKA—a wilderness retreat in the shadow of Mt. McKinley. Guided trips for hiking, tundra nature lore, wildlife photography, or just relaxing. Box 526, College, Alaska, for brochure.

CAMPING FOR GIRLS—Fun, adventure, friendship in Northern Michigan Dune Country. Ages 10-17. Trips and outdoor education with experienced staff stressed. Island outpost on Manitou Island in Lake Michigan. Director-Science teacher. Daily riding, waterfront, sailing, creative arts. 7, 4 and 3-week sessions. Crystalaire Camp, Frankfort, Mich. Catalog. Mr. and Mrs. Gus Leinbach, 1039 Olivia, Ann Arbor, Michigan.

CANOE TRIPS—in famed Quetico-Superior wilderness! Complete or partial outfits at low daily rates. Beginners welcome. Free canoe trip planning kit. Border Lakes, Box 569K, Ely, Minnesota.

WAMPLER WILDERNESS TRIPS—hiking and riding. California, Arizona, Mexico. Year around activities at moderate prices. Details: Box 45, Berkeley 1, California.

WANTED: Suggestions for retirement location with more nature than people, yet not remote from civilization. Living cost and climate are factors. Have two years to seek comfortable house, perfect spot near ocean or mountains. Fredric and Alice Pitts, Wilmington 99, Delaware.

Letters to the Editor

Young Member Hopes To Be Archeologist

I am interested in the work done by the National Park Service in the field of preserving America's natural and historic features. In New Mexico, I have visited White Sands, Bandelier, and Carlsbad Caverns. Each time the rangers were very kind and helpful. I am grateful to the National Park Service for the fine and wonderful work they have done.

I am fourteen years of age and after college hope to become an archeologist. Maybe I will have the opportunity to work with the National Park Service in the excavation of ruins in one of the programs in the future.

In conclusion I would like to become an active member in the National Parks Association and know more about your fine work.

BILL KIGHT, JR.
Hobbs, New Mexico

• For the Association, we welcome a young new member; and for ourselves we express the hope that the future will see him in a career which we think is one of the most fascinating of the sciences.—*Editor.*

Wonders About Predator Control System

The article in the December issue concerning "Wildlife Population Control and the Hunter" by Raymond B. Cowles was of interest to me since I have often wondered why States such as California continue paying bounties for natural predators such as mountain lions. Conversations with paid mountain-lion hunters have led me to believe that in general only an occasional old and weakened lion will by choice attack domestic animals. Otherwise their natural prey is the deer. It would seem that this could help a

great deal in controlling overpopulation, particularly of does and older and weakened animals. All this being the case, why do the States continue to offer these bounties? Do you have any comments on this?

A. L. EDGAR, M.D.
La Mesa, California

• We have these comments: that the bounty system of both predatory and other animal "control" is an anachronism, first assuming that it ever had any real value; that, measured in dollars and cents, the capacity for mischief attributed to predatory animals of all kinds is considerably exaggerated, drummed for reasons which, being finally resolved, are largely measurable in dollars and cents; that the system will probably continue because, like other habits, it is easier to continue than discontinue.—*Editor.*

Diplomacy During Early National Park Days

The death at Christmas of former Sequoia National Park Commandant Colonel White removes about the last of the U. S. Cavalry officers that once policed our national parks. Thus fades, too, the memory of those romantic social gatherings where the stock song was of the Cavalry's color stripe: "Around her neck she wore a yellow ribbon."

The Cavalry's task was no sinecure, and required diplomacy where laws were not yet enacted.

An example of Colonel White's diplomacy was his handling of sheepmen. The Big Trees of Sequoia National Park are interspersed with meadows. These are colorfully enameled with purple delphiniums, pink mimulus, golden buttercups, blue gentians, red fireweed. Sheep

arrive; in a day all beauty is gone. A Basque sheepman laughed at Colonel White. "You have no law to jail us." He *did* have the right to remove by force, however. His mounted soldiers expelled the sheepman at the Park's southeast, or desert corner. One third of the flock was expelled at the northeast corner, one third at the southwest, and the last third at the northwest. That ended the invasion by John Muir's "hoofed locusts."

Today the National Park picture is changed. Instead of \$50,000,000 buying a National Parks chain, one hears of Congress' annual appropriation of more than that amount for Director Wirth's Mission 66.

C. M. GOETHE
Sacramento, California

• We thank Mr. Goethe for a most interesting anecdote about the rough-and-tumble earlier days of the national park system, which he knows so well. As many of our readers are aware, Mr. Goethe and the late Mrs. Goethe have been called "the father and mother of the Park Service's interpretive program." It was the Goethes who, as a result of their observations of the *Wandervoegling* (nature study field excursions) of Europe, established an experimental "laboratory" for nature interpretation at Lake Tahoe, California, staffed by themselves and two University of California scientists, the Drs. Harold Bryant and Loye Miller. So successful was the experiment that Stephen Mather, first director of the Park Service, requested Mr. Goethe to move it to Yosemite Park; out of it materialized, in the nineteen-twenties, a school for ranger-naturalists for training leaders in the objectives of interpretation. —*Editor.*

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Schedule For Glen Canyon Dam

(Continued from page 15)

generated at Glen Canyon. It is a requirement of Acts of Congress that preference in power sales shall be given to public agencies and cooperatives. We have received many requests from preference customers who desire to purchase Colorado River Storage Project power. It is estimated that preference customers in the market area will use nearly all power generated by the project.

The Bureau of Reclamation is preparing detailed criteria

under which project power will be sold. The May 18, 1960, release by the Secretary of the Interior, copy of which is enclosed, contains broad guide lines. The marketing criteria will be announced soon and applications for power will be entertained. Based on applications received, allocations of power will be determined and contracts for the sale of power will be executed. Until these actions have been completed, we will not be able to announce with whom we have contracts for the sale of power.

N. B. BENNETT, JR.
Acting Commissioner, Bureau of Reclamation

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