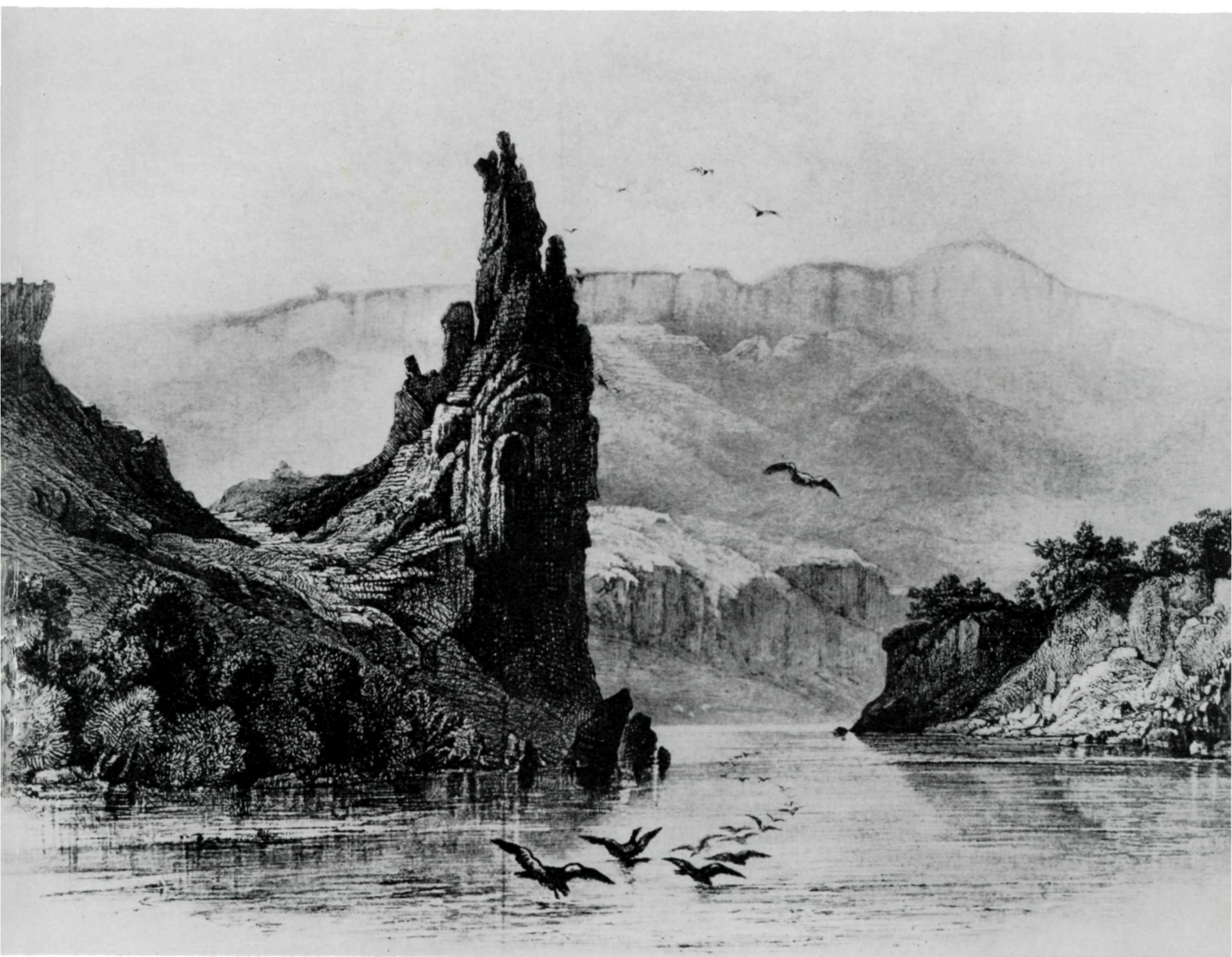
In This Issue: WATER CRISIS IN EVERGLADES NATIONAL PARK

NATIONAL PARKS *Magazine*



Cathedral Rock, as sketched by Karl Bodmer in 1833,
in the proposed Lewis and Clark National Wilderness Waterway

August 1965

The Editorial Page

Shame of the Everglades

THE STATE OF FLORIDA IS SEEKING massive Federal financial assistance for the completion of the so-called Central and Southern Florida Flood Control Project, which is really an irrigation and drainage project.

At the same time it refuses to release water from the existing works of that project into Everglades National Park, although the park is being destroyed for lack of water.

The Army Engineers have been dumping vast quantities of water into the Atlantic and the Gulf of Mexico during the last three or four years, and even the last few months, while the plants have been withering and the animals dying in the park.

It may well turn out, and perhaps very soon, that the American people will decide against further subsidies for drainage projects and land speculation in Florida until the State demonstrates a proper concern for the national interest in this matter.

The necessary releases of water into the park have always been contemplated by the plans for the drainage project; they were a stated part of its purpose.

The American people made it very clear at the time the park was established by Congress that they intended the park should be protected.

The Congress, so far as the American people know, has never repudiated this policy of protection.

If the question were put up to the nation now, we have no doubt whatsoever that it would insist on protection.

The State of Florida seems to take the position that the matter is out of its control, having been turned over to a partly autonomous body, the Flood Control District. The Army Engineers, for the Federal Government, seem to take the same position.

The District has alluded to an agreement by the Army Engineers, the National Park Service, and the District "to refrain from resorting to a campaign to advance each of our points of view." Any agreement by public agencies to withhold proper information from the public is always objectionable; in this case it is outrageous, and we think an explanation is called for.

The National Park Service has exhausted the resources of any reasonable patience in this manner. It is high time the District cooperated with the Government, from whom thus far all blessings have flowed.

Many people will see no reason why the American nation should continue to put up the money for any further development of the Central Florida Project until the District gives iron-bound guarantees that enough water will be released from the various storage areas into the park to maintain its unique bird and animal life for the benefit of the public in perpetuity.

The Federal Government has already spent some $112 million on the Central Florida Project. The expenditure of an additional $125 million or so is contemplated, mainly for drainage and irrigation in the Kissimmee River region northwest of Lake Okeechobee.

A nation-wide public sentiment appears to be growing against any further additional expenditures on such drainage and irrigation until the State and the District give permanent guarantees of abundant water supplies for the park.

The Federal Government has shown an intolerable weakness in this matter for some 20 years. The Army Engineers have let the authority they exercised as trustees for the nation slip weakly away, apparently in a series of back-stage deals and concessions in obtaining appropriations. The Department of the Interior, at the departmental level, apparently could not have cared less.

We think it is about time that the Secretary of the Interior got in touch with the Secretary of Defense and brought the Army Engineers firmly into line.

It is also about time that machinery be established in the Government for the coordination of Federal water management programs, in Florida and elsewhere, to prevent the repetition of shocking situations of this kind.

The Bureau of the Budget, we might note, has a proper interest in this problem. Government investments in park establishment, development, and protection should not be destroyed by Federally-financed drainage and water dumping operations.

The proposals for the storage of water in special reservoirs, made by Mr. Michael Straight elsewhere in this issue, on the basis of Mr. Stephen Raushenbush's recommendations, have great merit in showing how physical guarantees of adequate future water deliveries could be provided; permanent and binding arrangements for ample deliveries, whether by regulation, contract, or otherwise, are an integral part of such proposals.

For the immediate emergency, and the short run, the plans recently developed by Park Service Director George B. Hartzog, Jr., to sink wells into the water-bearing rock strata which underlie the northeastern corner of the park, and for pumping from such wells, also have merit.

The special pumps, however, would yield only about 70,000 acre feet, far less than the 250,000 acre-feet average considered necessary as a minimum for the park. The additional 180,000 acre feet could be provided, pending construction of deep reservoirs, by pumping from Lake Okeechobee, which might cost $90,000 a year. Nothing less than this can save the park pending permanent security arrangements.

The Secretaries of Interior and Defense should also be working actively together to ensure that the Army Engineers permit the National Park Service to participate effectively in the planning the Engineers are doing at the behest of Congress, supposedly to develop measures for the protection of the park.

(continued on page 20)

The President of the United States on Overpopulation

"Let us in all our lands, including this land, face forthrightly the multiplying problems of our multiplying populations and seek the answers to this most profound challenge to the future of the world. Let us act on the fact that less than five dollars invested in population control is worth a hundred dollars invested in economic growth."

From the address by President Lyndon B. Johnson to the Twentieth Commemorative Celebration of the United Nations at San Francisco, June 25, 1965.

Help Save the Everglades!

If you agree that the Secretaries of Interior and Defense ought to get together and work out a Government program to save Everglades National Park, you can write to them as follows:

Honorable Stewart L. Udall, Secretary of the Interior, Washington, D.C.

Honorable Robert S. McNamara, Secretary of Defense, Washington, D.C.

NATIONAL PARKS *Magazine*

OFFICIAL PUBLICATION OF THE NATIONAL PARKS ASSOCIATION

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Front cover photograph courtesy National Park Service

In 1803, President Thomas Jefferson instructed Captain Meriwether Lewis "to explore the Missouri River, and such principal stream of it, as, by its course and communication with the waters of the Pacific Ocean, may offer the most direct and practicable water communication across this continent. . . ." At the time Lewis and his chosen co-leader, William Clark, journeyed up the Missouri on their historic exploratory mission, the river flowed unhindered for some 2300 miles. Today, the future of the remaining 180 miles of natural river—between the headwaters of the Fort Peck reservoir and Fort Benton, in north-central Montana—is in controversy. Briefly, the question is: shall the remaining few miles of unspoiled Missouri be submerged by reservoir waters, or shall they be incorporated, as the National Park Service has proposed, into a scenic, scientific, and historic preserve —the Lewis and Clark National Wilderness Waterway? (Article, page 10).

The Association and the Magazine

The National Parks Association is a completely independent, private, non-profit, public-service organization, educational and scientific in character, with over 28,000 members throughout the United States and abroad. It was established in 1919 by Stephen T. Mather, the first Director of the National Park Service. It publishes the monthly *National Parks Magazine*, received by all members.

The responsibilities of the Association relate primarily to the protection of the great national parks and monuments of America, in which it endeavors to cooperate with the Service, while functioning also as a constructive critic; and secondarily to the protection and restoration of the natural environment generally.

Dues are $6.50 annual, $10.50 supporting, $20 sustaining, $35 contributing, $200 life with no further dues, and $1000 patron with no further dues. Contributions and bequests are also needed. Dues in excess of $6.50 and contributions are deductible for Federal taxable income, and gifts and bequests are deductible for Federal gift and estate tax purposes. As an organization receiving such gifts, the Association is precluded by law and regulations from advocating or opposing legislation to any substantial extent; insofar as our authors may touch on legislation, they write as individuals.

Membership in the Association carries with it subscription to *National Parks Magazine*. School and library subscriptions are $5 a year; individual copies 50 cents. Letters and contributed manuscripts and photographs should be addressed to the Editor at Association headquarters. The Association is not responsible for loss or injury to manuscripts and photographs in transit. Return postage should accompany contributions. Title Registered U.S. Patent Office. Indexed in the *Reader's Guide to Periodical Literature*. Printed in the U.S.A. Second-class postage paid at Washington, D. C.

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The Water Picture in Everglades National Park

By Michael Straight

THIS YEAR, THE UNITED STATES HAS been in danger of losing an irreplaceable asset: the Everglades National Park in southern Florida. The problem, in all of its ramifications, is immense and complicated; but the danger to the park can be summarized in simple terms:

The park is almost wholly dependent upon supplies of fresh water flowing in from the north.

This flow of water, unimpeded over the long life of the Everglades, is now largely controlled.

Control is exercised by a state agency on the basic principle that the interests of the park are subordinate to the agricultural and municipal needs of southeast Florida.

The park has suffered substantial damage in the past four years of drought. Unless its needs are recognized and provided for, the damage may become irreparable. "Without water," Dr. C. P. Idyll, marine biologist, declared in recent testimony, "the vegetation will change from a wetland to an upland plant complex, and the enormous variety of invertebrate and vertebrate animal populations will be altered. Then the area will cease to be unique, and its justification as a national park will disappear."

The United States and the State of Florida will have to act together if the park is to be saved; they will have to act on both an emergency basis and a long-term basis. As an emergency measure, the National Park Service is planning to dig a sump, lay pipes, and pump water from the Biscayne Aquifer, one of the formations of highly permeable limestone that underlie south Florida, into the drainage of the Shark River Slough in the southwestern part of the park to save that biologically vital area; but more than emergency steps are necessary. The steps are made more difficult by the patterns of joint action which have been established over the course of the past forty years.

In Everglades National Park, the nation's only semi-tropical preserve, the historic pattern of plant and animal life is perpetuated by ample seasonal inflow of fresh water from the north. Below, wood ibis feeding in a normal winter.

National Park Service photograph

The diversion of fresh water above Everglades Park by canals and dikes, combined with several years of abnormally low rainfall in south Florida, has created park scenes like that shown below.

C. & S. F. Flood Control District photograph

The United States Government was drawn into joint action on a large scale in Florida by the disasters of 1925 and 1928, in which hurricane-driven waters of Lake Okeechobee spilled out over adjacent lands with the loss of some 2500 lives. Acting together, the State and the Army Corps of Engineers lessened the danger of hurricane flooding by releasing the waters of Lake Okeechobee east and west into the Atlantic and the Gulf of Mexico.

Seventeen years later, in a comprehensive report which it prepared for Congress, the Corps noted that the flood control works had "greatly altered" conditions in the Everglades. "Much of the development of Florida," the report added, had been undertaken "without any real knowledge of the area or of the hazards involved." The report concluded:

"The parched prairies and burning mucklands of the Everglades in 1945, the flooding of thousands of acres of farms and communities in 1947, and the intrusion of salt water into lands and water supplies of the east coast are basically the result of altering the balance of natural forces. The basic problem of this area is therefore to restore the natural balance between soil and water in this area insofar as possible by establishing protective works, controls and procedures for conservation and use of water and land."

The project, proposed by the Corps and subsequently undertaken, included the extension of levees around Lake Okeechobee, and the widening of existing canals. Its central feature, however, was the creation, by a system of levees, canals and pumping stations, of three large Conservation Areas south of Lake Okeechobee, in which the lake's excess waters would be stored. "During large floods," the report declared, "substantial releases of water through the controlled Tamiami Trail embankment would result in flows into the national park area similar to those

An alligator track, winding across the drying muck of an Everglades Park slough, tells the story of poor planning and indifference to park values during the development of south Florida. Photograph was taken in late winter, 1965.

National Park Service photograph: Bob Haugen

which prevailed when the natural flood waters of the Everglades passed to the sea through that region. In dry periods it would be possible, because of the proposed conservation areas, to release water into the park area." Thus, the report stated, "this comprehensive water control plan, and the national park plan are complementary features of federal activity necessary to restore and preserve the unique Everglades region."

Ample Water For All

The central assumption of the report—that there would be enough water for all existing and potential users—formed the basis for the "controls and procedures" which the plan established for the "conservation and use of water and land." The plan provided that "the Federal Government should maintain and operate all features of the project including levees, canals, pumping stations and control works, in cooperation with the appropriate State and local agencies." It assumed that the Corps of Engineers would retain the right to hold or to release all controlled waters for the purpose of preventing floods. It did not specify what voice the Federal Government would have in determining how the stored water would be used.

This failure to define the national interest in the use of water within Florida undermined the central purpose of the project—the restoration of the natural balance of soil and water in the State. For the failure was never corrected by the agency responsible for the park—the Department of the Interior. In approving the 1947 plan of the Corps of Engineers, William Warne, Assistant Secretary of the Interior, noted that "as concerns the National Park Service, the question is not one of too much water, but a guaranty that there shall not be too little." No specific legal guaranty was exacted, however, and none was given. To this day no written agreement exists between the State of Florida and the Federal Government to provide the assurance of a minimum supply of fresh water for the park.

The United States put up eighty percent of the capital costs of the project; its maintenance costs were taken over by the State. In accordance with a recommendation made by the Corps of Engineers, the State consolidated local flood control and drainage activities in a single agency: the Central and Southern Florida Flood Control District. This agency, although it is responsible in some degree to the Governor and his Conservation Board, collects local taxes as well as state funds and operates, in effect, as an autonomous body. It has, in practice, assumed the power to determine when and for what purposes all waters other than flood waters may be released through the facilities owned and operated by the Federal Government. The Corps of Engineers, despite its interest in "controls and procedures for conservation and use of water and land" has acquiesced in this division of responsibility. So, apparently, if only by default, have the Congress and the Department of the Interior. The District, on the other hand, as a state agency, has felt little or no responsibility for the Federally owned and operated entity at the southern end of the State—the Everglades National Park.

Riley Miles, chairman of the Governing Board of the District, in testimony given in January, identified himself and his fellow board members as "representatives of local interests." These interests, in turn, have multiplied in numbers, in wealth, and in their demands for water, under the pattern of land and water use established by the District. Possibly one billion dollars in value has been added to the 700,000 acres of agricultural land that is serviced by the District; cities have spread out into an almost continuous line along Florida's southeastern coast. The population of Palm Beach, Broward and Dade Counties was 214,000 in 1930, and 471,000 in 1945. There are now more than a million residents in Dade County alone.

The officials of the District find it hard to understand the views held by officials of the park. One group talks the language of cattlemen, citrus growers and real estate developers; the other group worries about the disappointment of visitors to the park; alligators, crayfish and storks; and the multimillion-dollar shrimp industry. One group traps the water and uses it for a measurable purpose; the other group, insisting on the value of "continuous salinity gradients," refuses to build containing walls within the park, and lets the water it receives run out to the sea to maintain the desired ecology.

Not long ago, the grandfathers of the men whom the District serves were engaged in draining the Everglades in an effort to turn all that unused land to an economically productive use. They find it hard to concede that water which may be needed on farms and in cities should be "wasted" in the park. Even if the water is not needed elsewhere, there are reasons, they believe, why it should not be released to the park. They fear that ordered releases of water to the park in dry periods may establish a precedent which will restrict the supplies available to other users in years to come.

Drought Brings Threat

The threat to the park inherent in this situation was largely concealed until the present cycle of dry weather began in 1961. The level of water in Conservation Area 3 just north of the park (see map, page 9) began to sink in that year and, when a second dry year followed in 1962, it sank below the level at which, by agreement believed to be in effect between the Corps of Engineers and the District as to release levels, water could be released to the park. The gates at the Tamiami Trail levee were closed in December, 1962. Save for a few brief periods, they have remained closed.

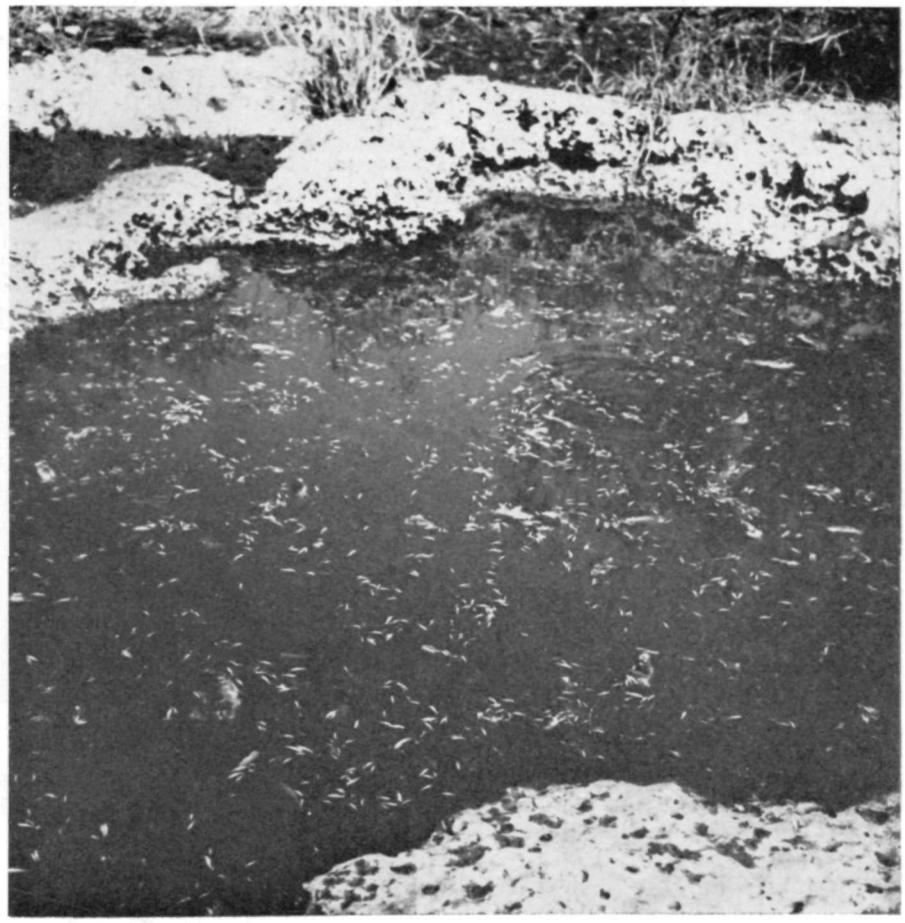
In 1962, concern for the Everglades led the Congress to authorize the Corps of Engineers to study the needs of the park, and to recommend measures to insure its water supply. The study may not be completed until 1967. Meanwhile, Stanley Joseph, the park superintendent, has sought to obtain a minimum annual release of 250,000 acre-feet of water—an amount equal to the average flow over the past twenty years. His request was opposed by many local interests in the January hearings held by the Corps of Engineers. "They have overestimated their needs," F. D. R. Park, the Dade County Water Control Engineer, said of the Everglades officials; "some exaggeration is involved."

Mr. Straight, prominent both as editor and author, is a trustee of the National Parks Association. His article is based on a study of the Everglades water situation conducted for the Association by Mr. Stephen Raushenbush, widely recognized as an expert on the management of natural resources.

Four months later, Everglades Park rangers were attempting to rescue alligators stranded in drying muck, and Air Force demolition experts were blasting holes in the parched earth of the Everglades in an emergency effort to provide additional reservoirs for survival of park wildlife. "If we don't get water," Joseph told a reporter in May, "it will mean the end of the park as we know it today."

Each spring water is drawn out of Lake Okeechobee in preparation for the rainy season, which starts in mid-July. Much of the water is pumped onto the fields which lie to the south of the lake; some is moved to the conservation areas. During the years 1963, 1964, and 1965, approximately 1,500,000 acre-feet of water not needed for agricultural or municipal use was released into the ocean, according to the U.S. Geological Survey.

In 1965, during one of the driest springs on record in Florida, 320,000 acre-feet of water flowed out of Lake Okeechobee. Of this total, only 140 acre-feet was released to the park. Then, on April 7, the Corps of Engineers opened the gates in the St. Lucie Canal and the Caloosahatchie River, and many thousands of acre-feet of water was released into the Atlantic and the Gulf of Mexico. A total of 70,000 acre-feet was poured into the sea before the releases were halted on April 22. This amount of water could have saved the wildlife of the park to a large extent.



National Park Service photograph: Bob Haugen

The drying pools of the Everglades are littered with dead fish—bream, killifish, and bass. The mortality is caused by lack of oxygen in receding pools. The National Park Service has installed an aerator on the Anhinga Trail to oxygenate the water as an emergency measure; it is presently running 24 hours a day.

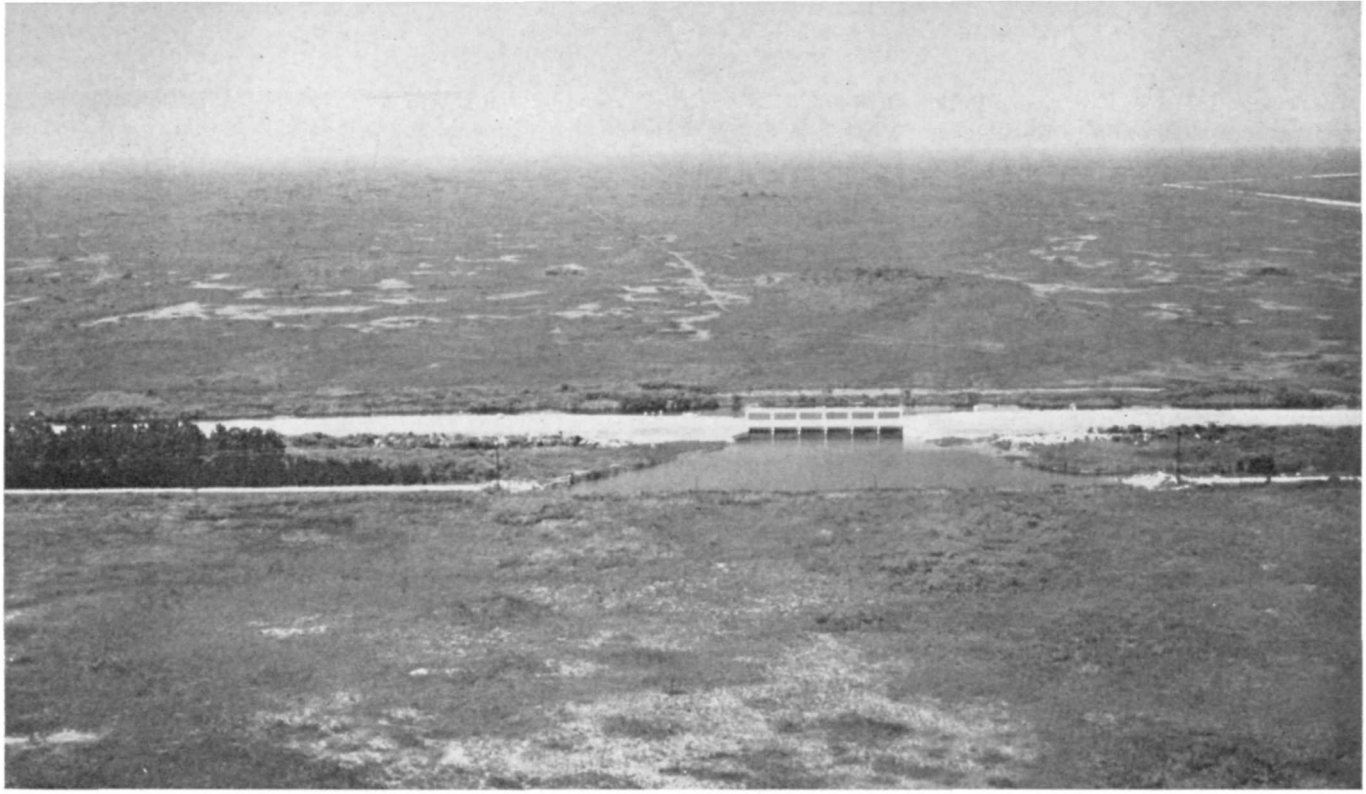
Explaining the Wastage

In defending this action, officials of the District explain that moving the water into Conservation Area 3 would have involved additional costs in pumping, and that the seepage of water as it moved south would have resulted in further pumping costs for the farmers of the area. In any case, they claim, some water would have been lost through evaporation, transpiration, and seepage as it moved across the thirty-five miles of marshland in Conservation Area 3. Here, the officials of the District may have been right; but the wastage of water while the park was suffering from drought was condemned in newspapers both within Florida and across the country. The intensity of the reaction was perhaps one reason why the Governor and representatives of the Federal Government were able in June to agree upon an emergency National Park Service project which may pump 73,000 acre-feet of water annually from a sump in the northeastern corner of the park on the Biscayne Aquifer, into the park (see map).

This first emergency step is to be applauded, both as a relief measure and as an expression of the concern felt by the State of Florida for the welfare of the park. It can and should be followed by new water storage for the park. Presumbly this could be accompanied by a long-term working agreement between the Flood Control District, the National Park Service, and the Corps of Engineers in which the legitimacy of the park's needs for an average of around 400,000 acre-feet, and minimum release of 250,000 acre-feet of water in a dry year, is recognized.

Little can be gained by viewing the needs of the park only in emergency and in isolation, and still less can be gained by pitting the needs of the park against those of the area served by the District. Is it realistic, then, to hope that the needs of both users can be met in the future from the existing sources of supply? Work is underway now to increase the storage capacity of Lake Okeechobee, and to improve the storage efficiency of Conservation Area 3. At the same time, a new and major source of demand for water is emerging as southwest Dade County is turned into an agricultural and industrial center. The population of Dade County, in which the eastern half of the park lies, is expected to rise to approximately four million within the next twenty years.

The development of Florida seems certain to continue, unchecked and un-



National Park Service photograph: Bob Haugen

Line of demarcation between water and parched earth: the Tamiami Trail at the northern boundary of Everglades National Park. In this aerial photo, the vast expanse of Conservation Area 3 lies beyond the road and the water-control point; view looking north out of the park.

controlled. It creates the prospect of an over-all shortage of water in southern Florida unless additional reservoirs are constructed to prevent the waste of water into the Atlantic.

Attitudes within the State are changing. Two years ago, in correspondence with the National Parks Association, an official of the Flood Control District expressed the District's earlier views. "If, in fact," he wrote, "the national park needs or wants a supply of water greater than that supplied by nature, it is our opinion that it may be had only by controlling the flow of water from the park."

However, in 1965, Mr. Miles outlined a more useful solution. No new lands were available for use as storage areas, he stated; the over-all depth of the existing conservation areas should not be increased. But a deep reservoir could be constructed in a relatively small portion of Conservation Area 3. "If it should be used for water conservation only," Mr. Miles declared, "it would provide a very efficient and effective reservoir, adequate in all probability to solve the water supply problems of the national park and the southeast coastal areas."

The deep reservoir proposed by Mr. Miles would be placed in the northeast corner of Conservation Area 3 (*a* on map). It might cover 64,000 acres, and its operating capacity would be about 640,000 acre-feet. Once filled, it might take about 560,000 acre-feet of water a year from Lake Okeechobee. After allowing for losses from evaporation it would provide a flow of about 400,000 acre-feet of water a year.

Possible Larger Reservoir

A second possibility, now under study and consideration by the Corps of Engineers, is a larger reservoir (*b* on map), that might cover 166,000 acres and occupy all the northern part of Conservation Area 3. Its operating capacity would be 1,700,000 acre-feet; it would, once filled, take about 926,000 acre-feet of water from Lake Okeechobee and it would (after allowing for higher proportionate losses from evaporation) provide a flow of about 510,000 acre-feet of water a year for all purposes.

It is too early to determine which of these alternatives is preferable. If one or the other reservoir system is to be constructed, then it is not too early to consider the operating principles on which it would be built and used. In either case pumps would probably be required to move the water from Lake Okeechobee and from present diversion canals into such a reservoir. Additional pumps might also be necessary between the new reservoir and the Tamiami Trail, which forms the park boundary below Conservation Area 3, to insure the park water supply.

If past practice is followed, the capital cost of the new reservoir would be met largely by the Federal Government. Its costs of maintenance would be met by the State, and the State, acting through the Flood Control District, would seek a substantial, if not predominant, role in determining how its waters would be used.

In the absence of a contractual agreement between the State and Federal Governments controlling the distribution of the stored water, this arrangement would clearly be self-defeating from the point of view of the park. Given the present rate of development in Florida, the park might be no better off in twenty years than it is today.

The validity of this point was apparently recognized by Mr. Miles in his

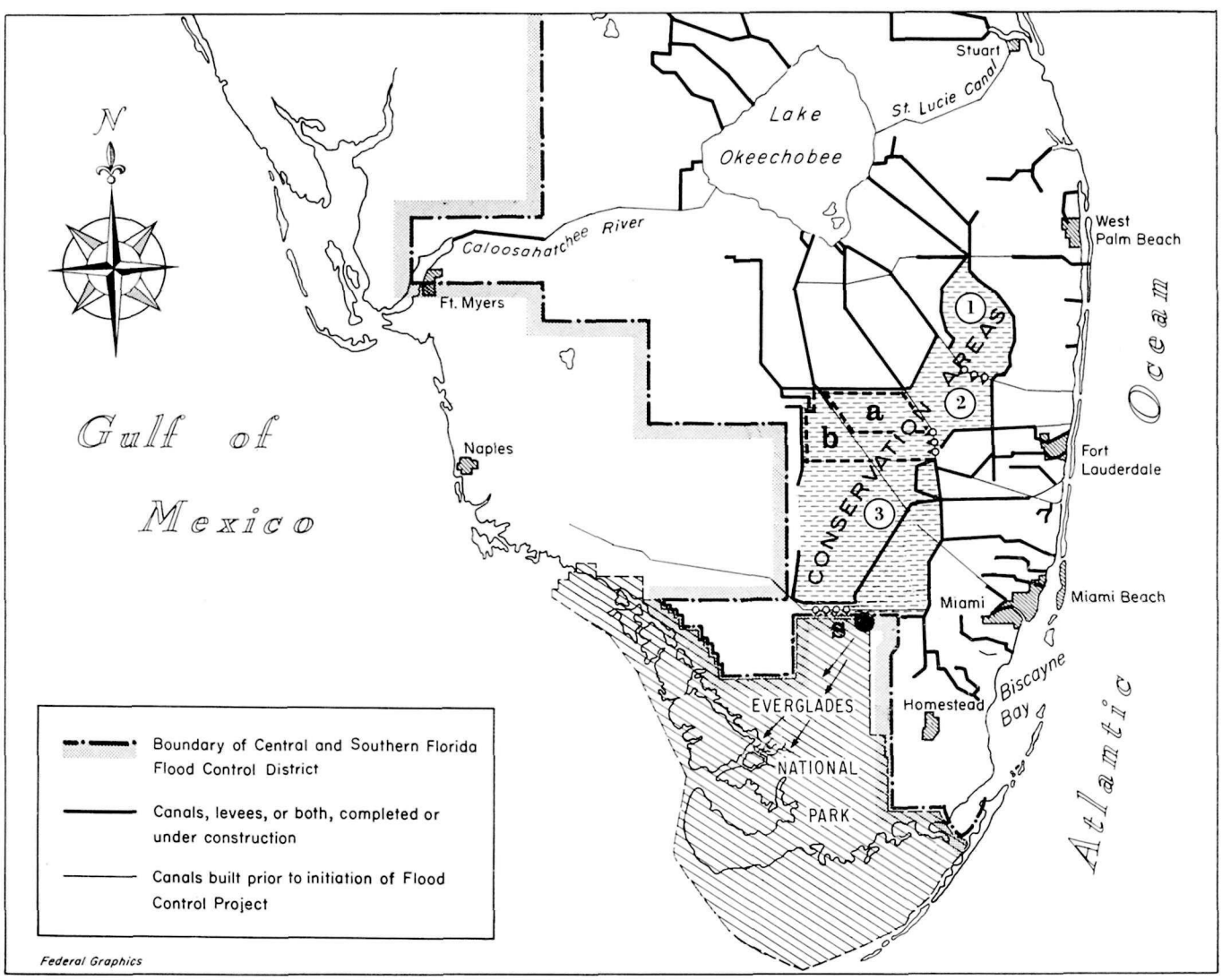
testimony. For he took it for granted that a radically different pattern of control would be established for the new reservoir. "It is our position," he testified, "that the costs of project modifications or additions made for the specific and sole purpose of augmenting the national park's water supply must be borne wholly or at least in very large part by the Federal Government. "Of course," Mr. Miles continued, "if areas of the District are also benefited by the Project, the District would expect to support them financially in proportion to those benefits."

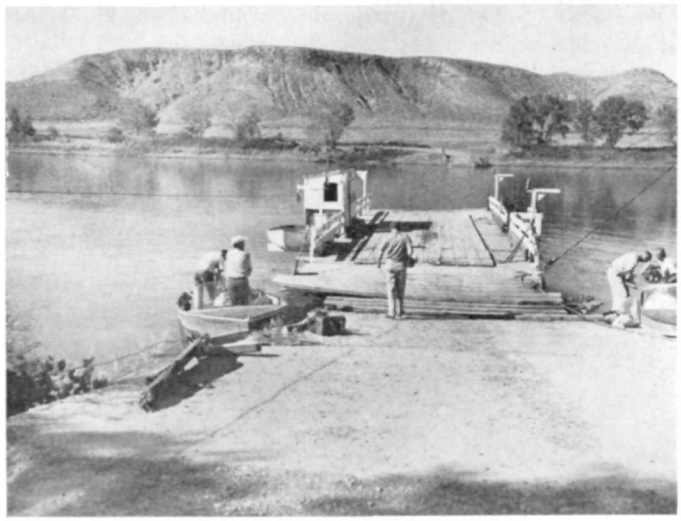
Here, Mr. Miles foresaw a water storage and distribution system within the State, operated for the predominant, if not the sole benefit of the park. There is much to be said for this approach. If it proved, for various reasons, to be the most promising pattern of development, then conservationists and all friends of the Everglades will muster all the support they can for the new project.

Nonetheless, the uncertainties are plain. For example, the new reservoir would depend in large part upon the supplies of water released to it from Lake Okeechobee. But, in the absence of an over-all agreement, what assurance would there be that, in dry periods, water supplies would be made available to the reservoir from the lake?

The time has probably come for the nation to assure Everglades National Park of an adequate supply of water from any such new reservoir it may finance. The emergency pumping operation of 1965 should not be mistaken for a long-term solution to the drought problems of the park. The default of 1943 should not be repeated. In any working relationship between the National Park Service, the Corps of Engineers and the Flood Control District the park should not again be forced to experience the threat of early extinction which it now faces. ■

The map shows Everglades National Park and the canal system that has evolved in southern Florida over the years; canals constructed under the Central and Southern Florida Flood Control Project are shown by heavier lines. The Project is presently about 40 percent complete. Seen on map are Conservation Areas 1, 2 and 3; letters "a" and "b" within the dashed lines in the northern part of Conservation Area 3 identify the reservoir possibilities of the Flood Control District and the Corps of Engineers, respectively. In the northeastern part of the park, "s" locates the sump from which water will be pumped into the park from the Biscayne Aquifer to make its way southwesterly toward the Shark River Slough as an emergency wildlife preservation measure.





The Virgelle ferry, at Virgelle, Montana, starting point for boat trips down the Missouri River and through the proposed Lewis and Clark National Wilderness Waterway.

National Park Service photograph

Whither the Wide Missouri?

By Gilbert F. Stucker

In May of 1804, Meriwether Lewis and William Clark launched their epic journey up the Missouri River on the first overland crossing of what is now the western United States.

Little remains of the river they knew; in a total length of 2,315 miles from the Rocky Mountains to its junction with the Mississippi near St. Louis, less than 180 miles still exist in a natural state. This surviving segment lies in central Montana, between the town of Fort Benton and the head of Fort Peck Reservoir, where the river has carved out a fantastic wilderness—a badland strip weird as a moonscape. It is known as the "Missouri River Breaks."

I visited the "Breaks" in 1964, my interest aroused by the conflict of interest between the National Park Service and the Army Corps of Engineers over the future of the area. Park Service plans called for preserving it as a wilderness waterway. The Engineers proposed to dam it, an action that would wipe out the wilderness, flood out the history, and so emasculate the landscape as to deprive it of all vital appeal.

Having weighed both sides of the question on paper, my object was to weigh the reality. In this I was aided by Park Service officials Harry B. Robinson and Chester L. Brooks, who did everything possible to insure the success of my trip. My companions were Emil DonTigny and Paul English, both of Havre, Montana. Emil, a veteran river-runner and scholar, had been recommended by the Park Service. Paul, a highway engineer, accompanied us in the interests of his avocation, archeology.

In the morning chill of September 26th, the three of us put into the Missouri at Virgelle Ferry, 42 miles downstream from Fort Benton. Emil's boat was an outboard cruiser powered with a 25-hp motor to which the business end of a pitchfork had been welded to prevent us from running aground in the shoal places. Amidships we had piled the duffle: four days' food, tent, some 1893 Missouri River Commission navigation charts, a copy of De Voto's *Journals of Lewis and Clark*, and a horn for calling geese.

The channel is some 600 feet across at this point, an iridescent raveling between the hills. Along its edges cottonwoods gather in isolated clumps, shading an understory of wild roses, willows and squawbushes. The current moves at a leisurely four miles per hour, quickening at the riffles and occasional rapids. Canada geese fly overhead, veering to Emil's sudden blast on his horn. Redhead ducks skim low over the bars. A belted kingfisher follows us from shore, emitting its peculiar rattling cry. Where the bottom deepens, eddies swirl and strong up-currents billow the surface. Herring-like goldeyes are apt to show themselves here, leaping out of the water; and, if one has a mind to fish, there are burbot, sauger, sturgeon, bullhead, catfish, and drumfish waiting for the bait.

At sundown the cliff swallows appear, circling the boat, feeding on insects close to the water. It is time then to tie

up to a convenient rock or log and pitch one's tent. There is no lack of likely places—some of them where Lewis and Clark camped a century-and-a-half ago.

We came to such a place our first day out. We had just rounded a bend when Emil tapped my shoulder and pointed to some cottonwoods on the left bank where a stream entered the river. "Eagle Creek," he said. "That's where they camped May 31, 1805."

With the scene essentially unchanged from that day to this, one could readily imagine the small flotilla putting in to shore; the six canoes and two heavier pirogues which, as Lewis jested, "Although not quite so respectable as those of Columbus or Captain Cook, were still viewed by us with much pleasure . . ." One could imagine, too, the explorers gathered later around the campfire under these same cottonwoods; the ascetic Lewis with his huge Newfoundland dog, Scannon; his amiable co-leader, the red-haired Clark; Sakagawea, the Shoshoni guide, hardly more than a girl; Clark's big African aide, York, and the two dozen or so other members.

Or, consider their camp of May 28th opposite Dog Creek, when a buffalo bull blundered into their sleeping midst, panicked, and in its haste to leave almost trampled the men, broke a blunderbuss and a rifle and, had it not been for Scannon, who stood like a hairy Rock of Gibraltar in front of his master's tent, would have carried both man and shelter off on his horns.

History, it would seem, has been too much in the reading and not enough in places like these. Here it does not come to us secondhand through the media of words, but speaks from the base of its own actuality in the living stuff of trees, rocks, rivers and the remembered presence of people. Here past and present are joined. That sense of particular time within which we normally move and have our being is somehow abrogated; we are put in touch with the totality of time and the sources of our existence.

* * *

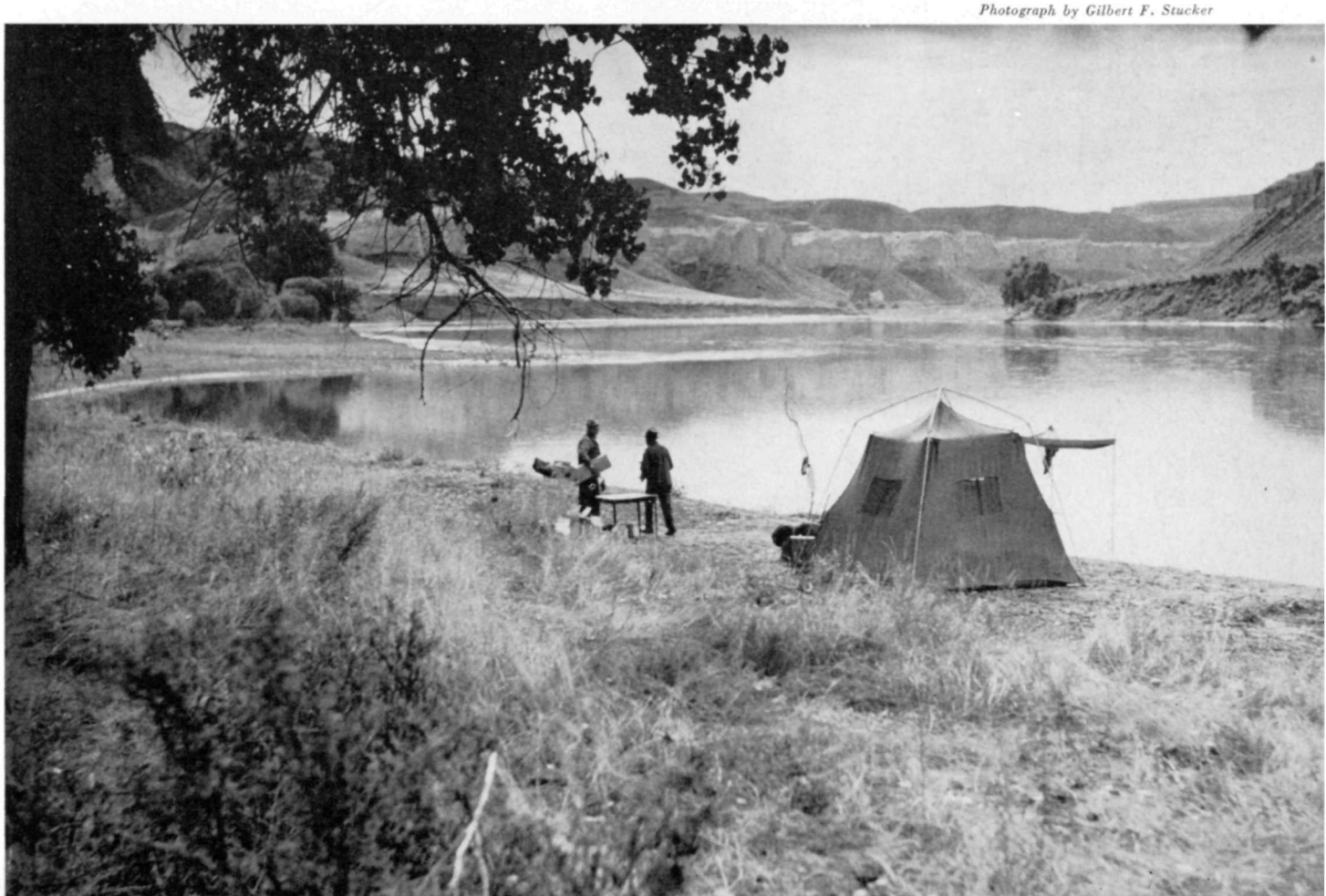
Since Lewis and Clark first made this region known, the formation called the "White Rocks" has moved men to wonder. A persistent feature for many miles, it dominates the landscape. We began to notice it as small outcroppings just below Virgelle Ferry. Soon it was rising in high cliffs on either side, constricting the valley into a winding corridor between walls of dazzling white. Massive, rising straight and sheer from the water's edge, it resembled chalk.

It is sandstone, laid down on the beaches and bars of an inland sea millions of years ago during the Cretaceous Period of earth history. The sediments contain petrified shells and fossil plants. From them has also come the remains of a dinosaur, *Ornithomimus grandis*, an ostrich-like reptile that presumably lived, a social parasite, on the nest-eggs of other reptiles.

A change came over the country as we moved downstream. Dark tower-like structures known as volcanic plugs poked above the horizon in startling contrast to the surrounding whiteness. In places the same rock formed dikes that stretched long distances like Chinese walls, or forked down to the river, straight and true, as if laid out with a surveyor's instruments. This was *shonkinite*, an intrusive

The author's party pitched a tent on the terraced shore of the Missouri and explored the wilderness of Dark Butte and Steamboat Rock. Lewis and Clark spent the night of May 30, 1805, a short distance downstream from this point.

Photograph by Gilbert F. Stucker



rock formed deep in the earth in a molten state, which had forced its way up through fractures into the overlying white sandstone beds, cooled and congealed, and was subsequently exposed and eroded into these strange forms.

Stranger still was the change that had come over the White Rocks themselves. Their matrix had become softer, more loosely-compacted, lending itself to the transforming effect of erosion. Walls that earlier hemmed us in had lost some of their massiveness, breaking down into V-shaped gullies and deeper coulees dark with pine and juniper and the moving shadows of deer. There could almost be discerned a kind of esthetic "development" as we moved along—from gross mass through the roughed-out beginnings of shapes toward an erosional climax, an earth expression so intricately formed as to appear unreal.

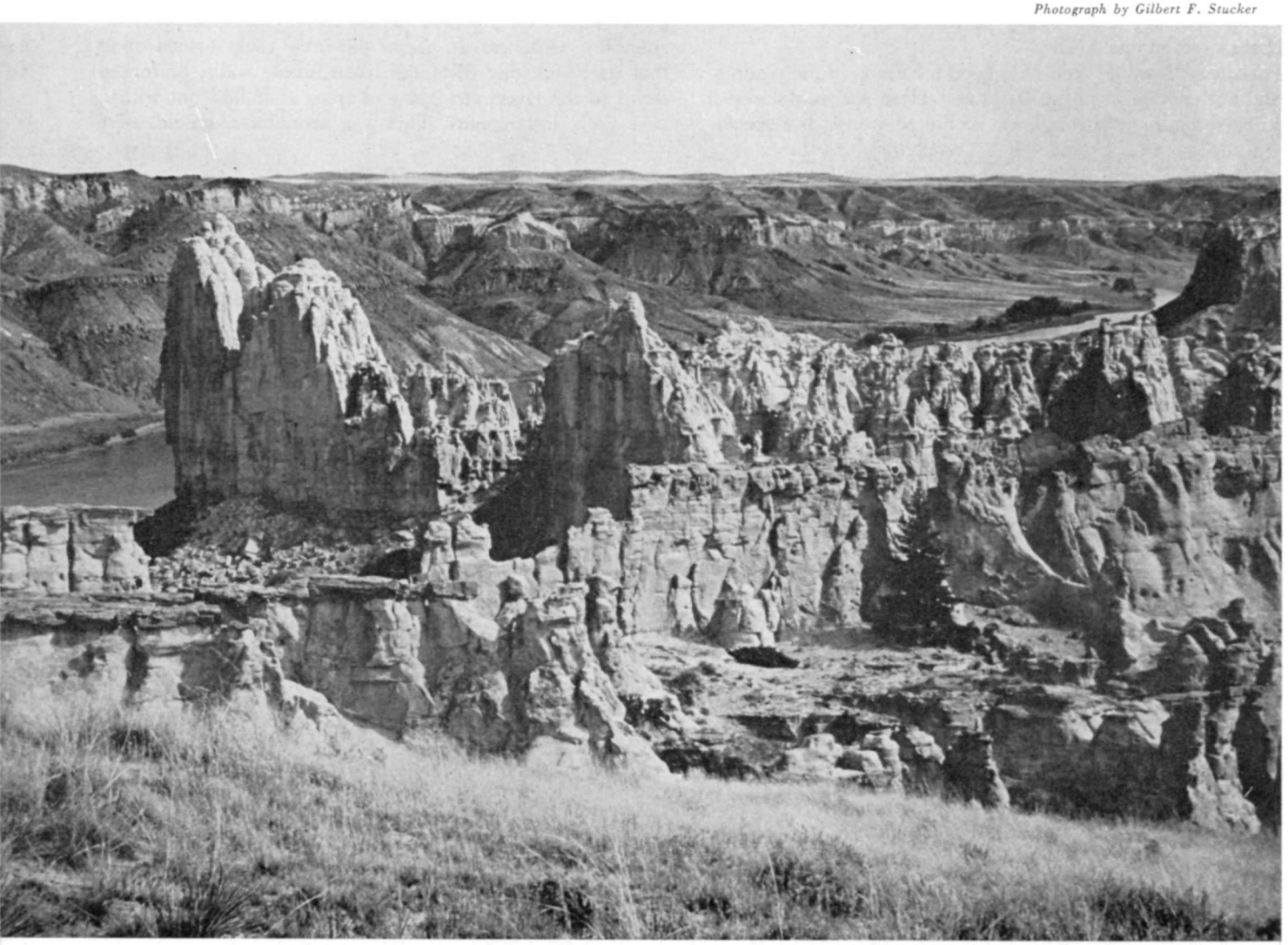
This climax was reached at the place called Hole-in-the-Wall. We had come upon it late in the afternoon, after negotiating the narrows at Cathedral Rock. It could be seen in the distance—a long, castellated ridge yellow in the sun, with a "window" at one end from which it took its name.

The window opened on the other side onto a high eroded terrace overlooking the river. Weird, yet exquisite, it appeared like some Hanging Garden of Babylon turned to stone. A natural parapet ringed it, walls honeycombed and pierced. Within was a galleried maze of color and shape—tapered, rounded, knife-edged, honed by wind and rain—spires, cupolas, turrets, archways hung with stony draperies. White figures in an alcove suggested alabaster carvings. Ironstone concretions, big as pumpkins, poised atop spindly pedestals, standing rank-and-file against a "fortress" wall like effigies at attention. Minarets soared spike-like into the sky, and from somewhere a muezzin called. It was only Emil with his goose-horn . . . or was it?

It was almost dark when we started down to the boat. Behind us in the thinning light the high stone towers looked unearthly and remote, as if drained of the hard, cold substance of fact. They seemed to stand at a verge, a destination, where matter had arrived at some final destiny of

Like a Hanging Garden of Babylon turned to stone, this corner of Hole-in-the-Wall overlooks the Missouri. Here, centuries of erosion have produced a climax terrain—a phantasy of sculptured rock.

Photograph by Gilbert F. Stucker



form. "Scenes of visionary enchantment," was the way Meriwether Lewis described it in 1805. In 1964 his description still held good.

It was this "enchantment" which so captivated the young Swiss artist, Karl Bodmer, and which he transmitted to his canvases. A product of the Parisian ateliers, later to become a member of the Barbizon School, he came up the river in 1833 aboard the keelboat *Flora*, in company with his patron, Maximilian, Prince of Wied, and the princely retinue—one Herr Dreidoppel.

Inquiry into Natural and Human History

Maximilian was a naturalist. His trip was to inquire into the American West and secure a collection of its fossils, fauna and flora, plus the vanishing culture of the Indians. While he ranged the riverbanks pursuing specimens, Dreidoppel hunted fresh meat for the next meal, and Bodmer painted.

The late Bernard De Voto wrote of him, "If Catlin has the priority of having first painted the West, Bodmer was the first artist who did it justice." Unlike Catlin, who sought to dramatize the actuality, Bodmer was faithful to his subject, and even today his paintings can be readily identified with the living landscape.

Bodmer, like Maximilian, was imbued with the urge to preserve. He sensed the evanescence in the scenes he depicted, the frailty of the wilderness places. He wanted to register them, to fix them in time, before they were gone.

Hole-in-the-Wall, perhaps more than most of the places that he knew, is marked with this fragility. Composed of soft, sugary sandstone, there are pockets in it where the leaching action of water has produced delicate filigrees which crumble to the touch like centuries-old lace. It would take but little to reduce this erosional masterpiece to the original beach sand of a hundred million years ago.

Yet that is what may happen, together with the destruction, not only of the entire White Rocks section, but of those spectacular wilderness reaches downriver which our party was still to experience and enjoy.

Approximately 70 miles downstream, the threat looms in the form of the proposed Cow Creek dam—a 365-foot-high, rolled-earthfill structure which would back water almost to Fort Benton. Still in the drawing-board stage, it is part of a "package deal" that the Corps of Engineers is offering; the other part being another, smaller, dam to be situated just above Fort Benton. Cost is estimated at $234,200,000 for the Cow Creek installation; $114,375,000 for the one at Fort Benton. This adds up to $348,575,000, plus the loss of an irreplaceable natural and historic part of America; a loss that cannot be calculated in dollars.

Neither of these dams is needed. They are not needed now or in the foreseeable future for flood control, irrigation or water storage. This is admitted by the Engineers.

The declared "need" is for power generation. But this is open to question. Certainly this "need" does not exist in Montana. The State is already exporting hydroelectric power to Utah, Wyoming and elsewhere. Ninety percent of Fort Peck Dam's output alone goes to the Dakotas.

The engineers maintain that a market for this energy will eventually materialize in the Eastern Division power marketing areas of their Missouri River Basin Project, which means the Dakotas, Nebraska, western Iowa and Minnesota. That transmission costs for such a long-haul power delivery might prove prohibitive does not appear to trouble them. Fortunately, it does trouble the Bureau of Reclamation, as Regional Director Harold Aldrich indicated last October in Billings when he questioned the economic feasibility of the two dams.

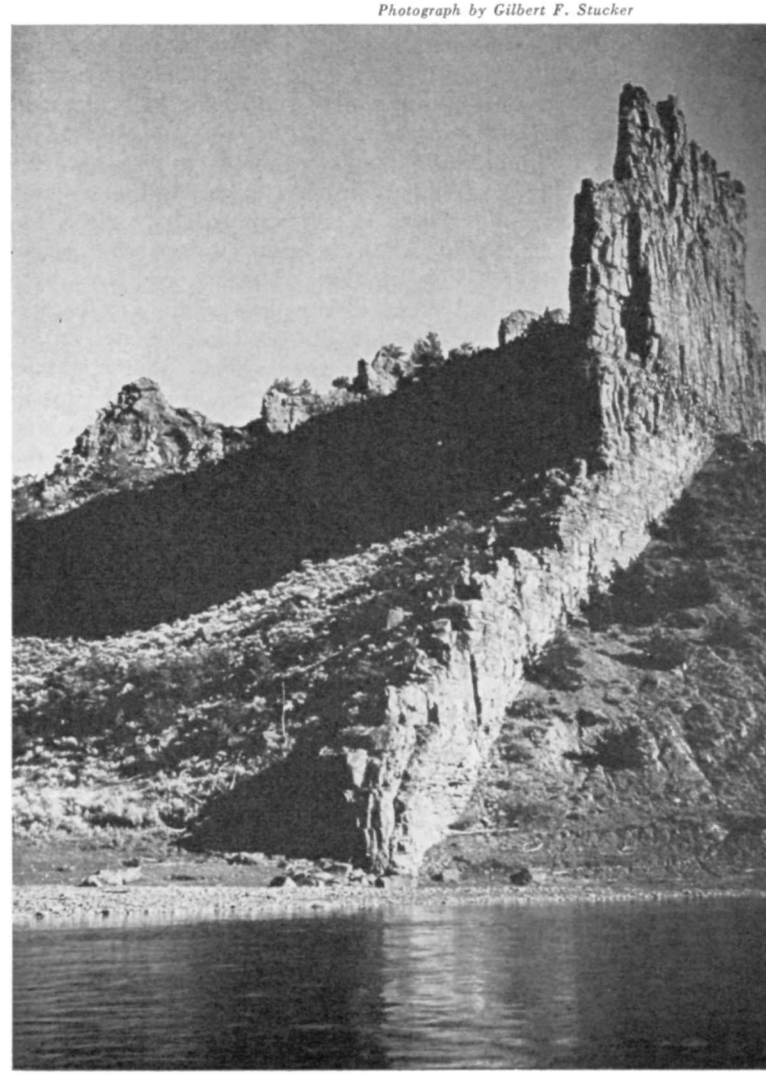
Can we, in any case, justifiably sacrifice what is positively needed here and now in its natural state for what may questionably be needed in some indefinite future—a future, moreover, in which hydropower will more than likely be replaced by nuclear power?

Even now, the new form is pushing ahead as more efficient, more economical. Nuclear plants can be located where the demand exists, thus obviating transmission overhead. The cost of power production itself is rapidly being reduced as proficiency in this field increases.

It is estimated that power production at the proposed Cow Creek and Fort Benton dams would cost between 6.45

The skyward thrust of an igneous dike reflects ancient volcanic activity along the presently proposed Lewis and Clark Waterway.

Photograph by Gilbert F. Stucker



and 6.8 mills per kilowatt-hour. Transmitting this power to the anticipated area of demand would increase the cost by approximately 2 mills, bringing the total price to the consumer to 8 mills or more per kwh. This is expensive electricity. Within 3 years, nuclear facilities now under construction will have power available for less than 4 mills. Within 10 years, according to the Office of Science and Technology, the cost from this source will be reduced even more—to about 2.5 mills.

Yet, our powerful dam-building interests continue to press for their grandiose water schemes, following, as Justice William O. Douglas has aptly stated, "old habits in dam building even when the technology that provided the rationale for them is becoming obsolete."

Captain Clark Names a River

We had dropped many miles down the river from that high, improbable world of the White Rocks. Before us now the valley of the Missouri spread out into wooded bottomlands, 6 miles across. Here we encountered the Judith River, flowing down from the Little Belt Mountains to the southwest.

The Judith was named by Captain Clark for Julia Hancock of Fincastle, Virginia, whom he later married. Lewis would have named it for the bighorn sheep that roamed the hills above it. Or, perhaps, for the beaver. Beaver were fond of its clear waters, plus the abundance of trees for food and dams, and it was not many years before the white fur-hunters were in the country and battling the Blackfeet Indians for possession of it.

Much of the battling centered about the mouth of the Judith, where Forts Chardon and Claggett and later Camp Cook were built. Peace efforts centered here also. The Jesuit De Smet made a valiant attempt in this direction in 1846. In 1855, 3500 Blackfeet, Flatheads and Nez Perce crowded onto the bottoms to attend the signing of the first treaty between the Blackfeet and the United States.

The era of the fur-hunter gave way to what might be termed, in a strictly regional sense, the era of the fossil-hunter. To the east of the Judith, cut through by the Missouri and its tributaries, lay the vast tumbled heaps of the true badlands—fossil-grounds ripe for the digging.

The first to explore them scientifically was F. V. Hayden, a man who later helped organize the U. S. Geological Survey, and who was largely responsible for the establishment of Yellowstone Park. He pioneered the area on a shoestring, coming in as supercargo on a fur-company boat in 1855 and prospecting the Missouri shores as the craft was towed laboriously upstream by the crew.

He thought the terrain more rugged than the Big Badlands of South Dakota. "Here begins a wild and desolate region known as the *Mauvaises Terres* . . ." he wrote. "No other portion of the upper Missouri country exhibits the effects of erosion and denudation on so large a scale, and to add to the picturesque effect of the country the variegated strata are distorted and folded in a wonderful manner . . ."

His collecting was, perforce, somewhat hurried because "of the risk of being cut off from the party and murdered by the Indians." So adept did he become at unearthing fossils *en passant*, however, that he became known to the Sioux as "the-man-who-picks-up-rocks-running."

Among his badland finds he picked up the second dinosaur discovery to be made in North America, the first having been made by him the previous year in what is now South Dakota. The collection included the remains of such dinosaurs as the armored *Palaeoscincus*, the dome-headed *Troodon*, and the *Trachodon*.

Another paleontologist to come under the spell of this country was E. D. Cope. With a party of four, in 1876, he scoured the outcrops, living mostly on cold bacon and hardtack enlivened with an occasional rump of mountain sheep. The tally, at the end of two months, showed 1700 pounds of bones. The prize was the type skeleton of the horned dinosaur *Monoclonius crassus*. Before the expedition ended Cope had been deserted by both his cook and guide who, hearing that Sitting Bull was in the vicinity, fled.

Nor did these hills escape the lyncean eyes of J. B. Hatcher. He returned to them on three different occasions. On his final trip, in 1903, he was teamed with T. W. Stanton of the Geological Survey. Close to a century after Lewis and Clark had opened this region of the world, a half-century after Hayden had opened it to science, Hatcher and Stanton—tracing out the ancient shorelines, poking into lake and lagoonal deposits, collecting—performed the task that brought the exploration of these badlands to its peak. Together, working out the stratigraphic relationships, they correlated the beds with their equivalents elsewhere and gave them final and permanent place in the geologic scheme of things.

Men of the Broadest Interests

It was not only with past ages and extinct faunas, however, that these men were concerned. Like Lewis and Clark before them, theirs was an interest in the whole of creation. Cope commented on the country as being "full of game," including grizzlies. Sternberg, his assistant, noted, during a November snow, "Countless herds of buffalo being driven to the badlands by the storm, along with . . . droves of deer, elk and antelope." In '88 Hatcher found deer and bighorns still abundant. Fifteen years later, he could only lament, "The mountain sheep seemed to have been nearly or quite exterminated, while a few deer remained." The buffalo and grizzly had of course vanished along with the elk, and the antelope herds were reduced to pitiful remnants.

This, fortunately, is not the case today. Due principally to the establishment of the Fort Peck Game Range in 1936 (since redesignated the Charles M. Russell National Wildlife Range), the animal population is making a comeback. Three hundred elk were brought in from Yellowstone Park in 1950. Bighorns have been reintroduced. The northern kit fox can be seen, and, rarely, the black-footed ferret. White-tailed deer frequent the islands and wooded bottoms, bobcats stalk the rugged places, and antelopes range the benchlands. Mule deer are plentiful. There are some prairie dog towns, and there is talk of bringing in buffalo.

Birdlife is prospering. An estimated 1,000 pairs of Canada geese nest here. Wild turkeys, sage and sharp-tailed grouse use the area. Plover and long-billed curlew live on the grassy benches back from the river.

As we proceeded down the river, our own encounters with the wildlife were frequent enough to be tantalizing.

Often, at dusk, we could make out the dim shapes of deer, always in pairs, as they bounded off into the darkness. Once we came upon a deserted prairie-dog colony, and another time a bighorn presented himself on a ridge top. We could see the huge, curled horns sweep around as he turned to look at us, then to drop out of sight over the rim.

There were signs, also, albeit scattered and forlorn, of a homelier nature—a ranch house fallen into ruins, a nester's hovel carved half out of a hillside, a cattle thief's hideout made of logs chinked with mud, a woodhawk's cabin.

Woodhawks were that special breed of men who made the steamboat era possible on the river. They earned their living supplying firewood to the big stern-wheelers that plied the Missouri from as far down as St. Louis. Belching sparks and smoke, these leviathans had voracious appetites, consuming as much as 25 cords of wood a day. From 1859 to 1877 they were a common sight on this reach of the river, and made many a fortune for their owners. Normally Fort Benton was the head of navigation, but low water late in summer often caused the boats to put in 150 miles downstream at Cow Island, a short distance below the currently much-debated Cow Creek.

We paused at Cow Creek toward the end of our last day and, sitting on the shore, surveyed the site of the contemplated dam. There, where the channel cuts in deep toward the left bank and makes it swing to the south, we thought about the many uses to which the great river has been put since the time of Lewis and Clark. We considered how those uses reflected the needs of the times: first, as an avenue of exploration; then, in providing access to the wealth of peltries that kept the fur trade in business; later, as an artery of commerce in the steamboat era; and, in the first half of the present century, as a means of power generation, irrigation, flood control and water storage through the vast system of multiple-purpose dams of the Pick-Sloan Plan.

Today we face a new need for the river, a need having not so much to do with our material interests as with the richness of experience, the greater realization of life—considerations difficult to define because intangible, but which are vital to our well-being as individuals and as a nation.

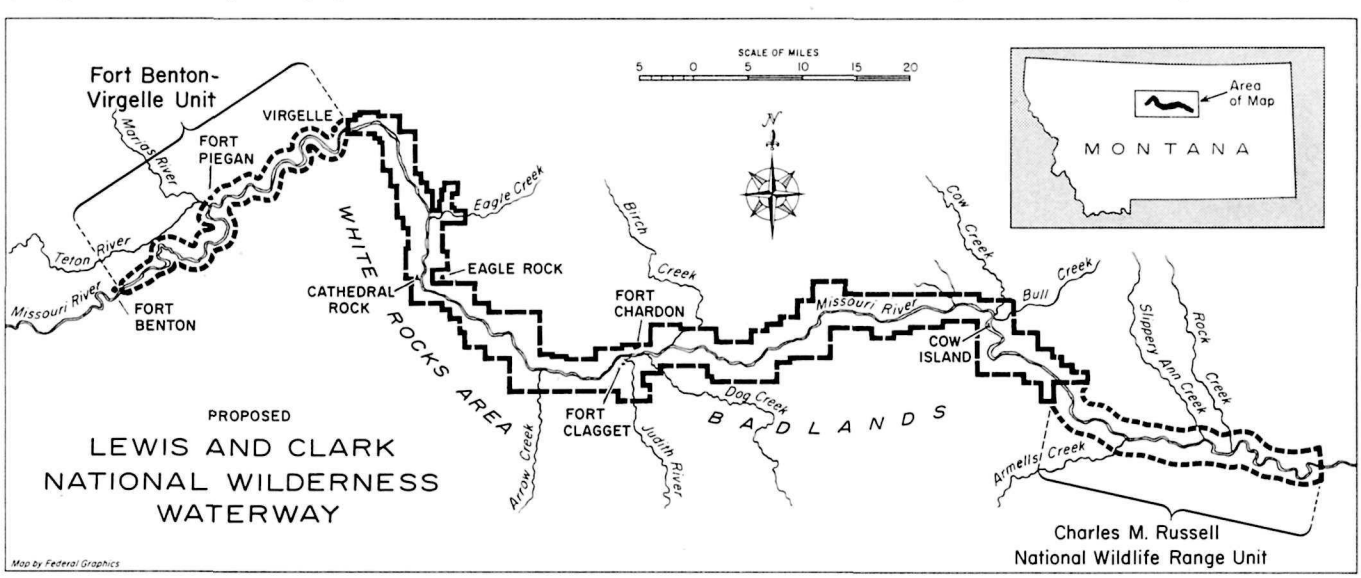
The Missouri River is more than moving water, more than a source of energy. It contains a resource that can transform men as well as their environment. Fortunately, in these remaining miles between Fort Benton and the head of Fort Peck reservoir, this resource is still available —in its open spaces, natural beauty and historic places.

To keep this resource available, the Park Service proposes to preserve the area as part of our national park system. To be known as the Lewis and Clark Wilderness Waterway, it would be sufficiently developed to insure its accessibility, administration and interpretation. The cost? Nine million dollars, a small fraction of the money required to build the dams. The gain? How can you measure it—by what slide-rule of the human spirit? To say that we would gain a unique natural area of 268,000 acres, incorporating 30 historical sites, 45 archeological sites, geological features of extraordinary scenic and scientific merit, plus the river itself, with its opportunity for wilderness boating and camping, is to mark only the beginning.

In March of this year, legislation was introduced in Congress by Senator Church of Idaho to preserve some of our remaining free-flowing rivers. The proposal is embodied in the Wild Rivers Bill, S. 1446, which would establish a National Wild Rivers System. If passed by the Congress, it would give immediate protection to portions of the following rivers: The Salmon and the Middle Fork of the Clearwater in Idaho, the Green in Wyoming, the Rio Grande in New Mexico, the Rogue in Oregon, and the Suwanee in Georgia and Florida. The Upper Missouri is not among them, but has been selected, along with nine other waterways, for study and *possible* inclusion in the Wild Rivers System. Whether it makes the grade is not only up to our legislators; it is up to us.

Dams or wilderness waterway? The choice is ours. ■

The proposed Lewis and Clark Wilderness Waterway, in north-central Montana. Preserve would be managed in three units: White Rocks Badlands Unit, administered by the National Park Service; Fort Benton-Virgelle Unit, to remain in present ownership with zoning controls; and Charles Russell Wildlife Range Unit, under jurisdiction of Fish and Wildlife Service, Bureau of Land Management, and Corps of Engineers. The Corps has proposed a dam at Cow Island which would inundate Missouri from Cow Island nearly to Fort Benton.



Life As a Fire Lookout in Crater Lake National Park

Text and photographs by Linda and Roy Neuberger

One angry evening, as we approached Crater Lake National Park in the gathering darkness of a summer storm, we looked out of our car window at the towering mountain before us. Suddenly, both sky and mountain were lit by three quick flashes, and the little cabin on the summit was whipped by lightning. We tingled with excitement, for in one week that little mountain-top cabin, almost 9000 feet above sea-level, would be our summer home!

The mountain we were looking at is Mount Scott, the highest point in Crater Lake National Park; the cabin on its summit is the fire-lookout tower, where we spent two fascinating months. The National Park Service maintains two lookout towers in the park. From late June, after the snow on the trails has melted, to early September, when snow marks the end of the "fire season," each tower is manned by a husband and wife lookout team. Our tower on Mount Scott was a sturdy, two-story wooden cabin with a concrete foundation; it served well as a fire lookout, for the summit of the mountain is well above any timber which might obscure the view.

On July third the Mount Scott trail was sufficiently clear of snow, and we began our ascent. Rangers and fireguards helped us pack supplies up the two-and-a-half-mile trail. The first night we listened to the howling wind, and I remember writing in my log that "we froze . . . in all six blankets." The morning sun was welcome, even though it streamed in at 4:30 a.m. It warmed us and thoroughly awakened us.

We lived and worked in the glass-enclosed top story. Considering the location, we lived in style; our furniture included a wood-burning heater, a gas refrigerator, and a gas stove. Two beds, a row of cabinets, a table, and the fire-finder, or "alidade," in the center of the room, completed the décor. The alidade is used to determine position of a fire in terms of the degrees of a horizontal circle, of which 0° (or 360°) is true north. Because the window frames might block the instrument's line of vision, it moves backward and forward on metal tracks so that virtually everything visible from the lookout can be sighted through its crosshairs.

A Superb View

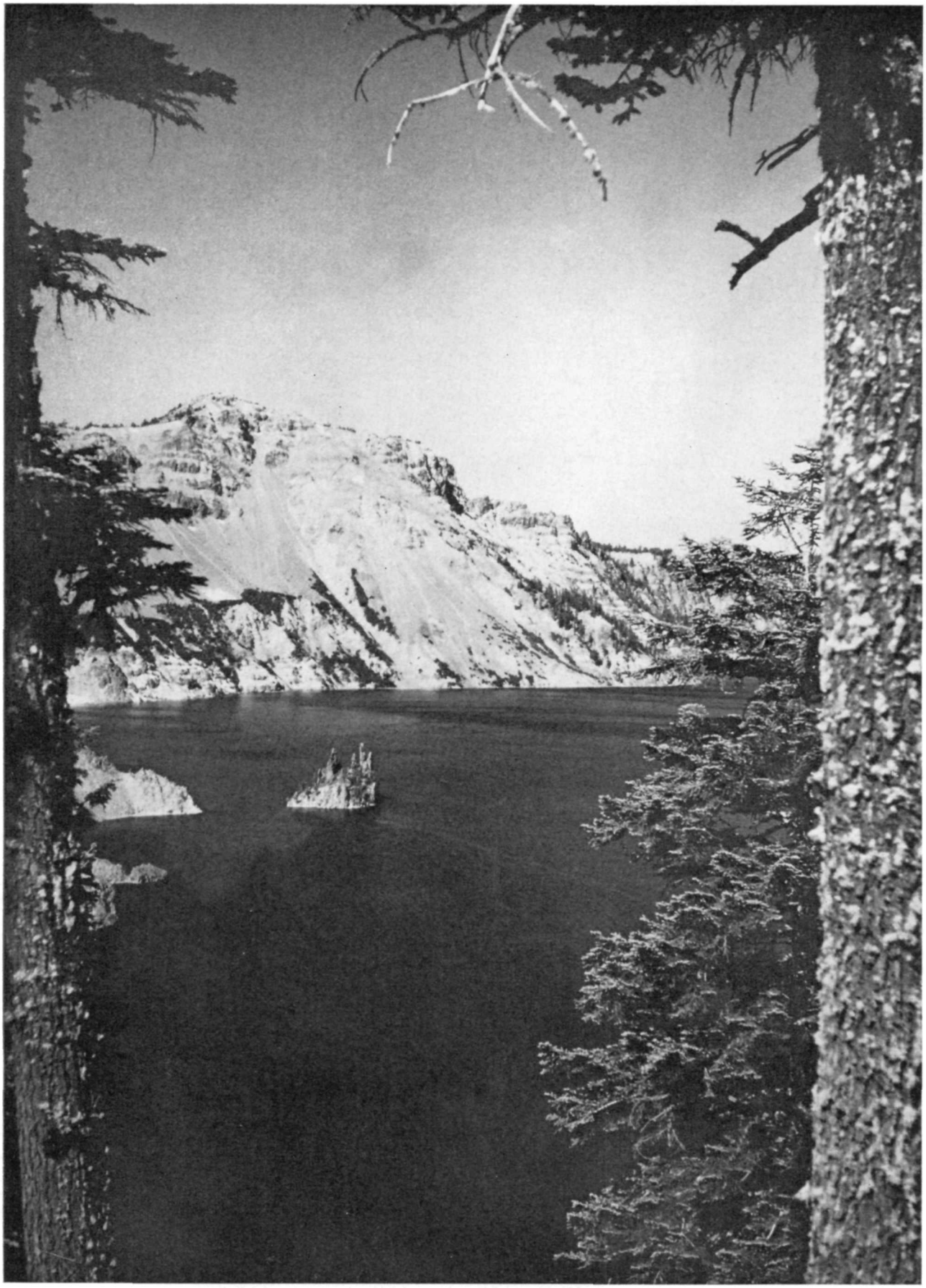
Mount Scott is two miles from the east rim of Crater Lake; the park's other fire lookout is directly across the water, on the cliff which forms the lake's west rim. Together, the two lookouts survey practically all of the park's 160,290 acres. Both have superb views: one looks directly down on the clear, blue water, while our Mount Scott lookout gave us views of the lake in a grand perspective of surrounding mountains. Forests ascend gently up to the lake's rim, and are met by cliffs which drop sharply down to the water's edge. These are indications of how the ancient volcano, which once covered the spot where Crater Lake now lies, sheared off its own flanks when it collapsed in on itself after cataclysmic eruptions. But all this happened over 6500 years ago. The deep hole left by the collapsed volcano has since half-filled with rain and snow, creating Crater Lake. The park is now peaceful, with not even a wisp of subterranean steam.

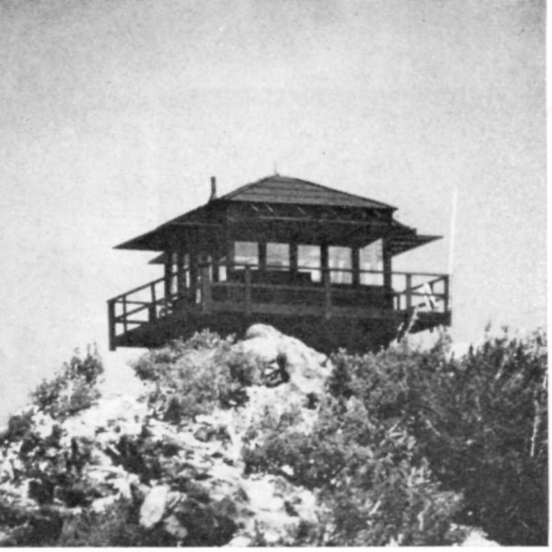
At the lower elevations of the park, in the "Transition Forest Zone," we found luxuriant forests of ponderosa pines, Douglas firs, white firs, and sugar pines, as well as aspens and cottonwoods. Vegetation on a higher level, in the "Canadian Life Zone" near the lake's rim, is mainly fir and hemlock, with some lodgepole pine. At the highest elevations, in the "Hudsonian Life Zone," whitebark pine predominates. The great changes in elevation within a relatively small area occur because much of the park is on the slopes of the extinct volcano.

From the summit of Mount Scott we could see beyond our immediate surrounding of forest and lake: if we looked far to the north on a clear morning, the shining summit of Mount Hood greeted us from 175 miles away. To the east, over marsh and distant hills, lay the flat semi-desert of central and eastern Oregon. Looking southwest, beyond the wide valley of Klamath Lake, we could easily see California's massive Mount Shasta, 105 miles away.

The distant view was a mosaic of

Framed between hardy conifers which line the edges of Crater Lake, the strange rock formation known as "Phantom Ship" glows in the sun.





The lookout tower is perched 9000 feet above sea-level on rugged Mount Scott.

quiet beauty. But near us, on the summit, there was movement: red-tailed hawks and marsh-hawks occasionally soared a few feet from the lookout, then turned over in the air and were a thousand feet below in seconds. Sometimes eagles glided past, while ground squirrels and marmots peered between rocks. Early one July morning two buck deer stood boldly in the sunlight a hundred feet from us, then suddenly bounded down the slope toward the lake. Western pasque-flower, creeping pentstemon, and Indian paintbrush were among the attractions that lured several rufous hummingbirds to the summit. And often, the rugged white-bark pine seemed mobile as it bobbed eastward, fighting the raging wind.

Our first job each morning was to make the beds and straighten up the lookout; we could never tell when early-rising hikers would arrive. Some nearly caught us in our pajamas! Breakfast became an exciting scenic adventure; the lake was at its deepest blue, and the surrounding hills and valleys were cloaked in thick, white morning clouds tinged with gold from the bright sun behind us. We had an average of nine visitors daily, although one hectic day we managed to collect 81 signatures in the guest book. When not talking with visitors and watching for fires we had numerous chores, one of which was shovelling snow for water into ten-gallon cans. How we appreciated modern water facilities then! When our snow melted in mid-August, water was hauled up in a motorized wagon, but we still had to carry all our food and personal supplies up the hard way. It was tiring at first, but we soon got in fine shape.

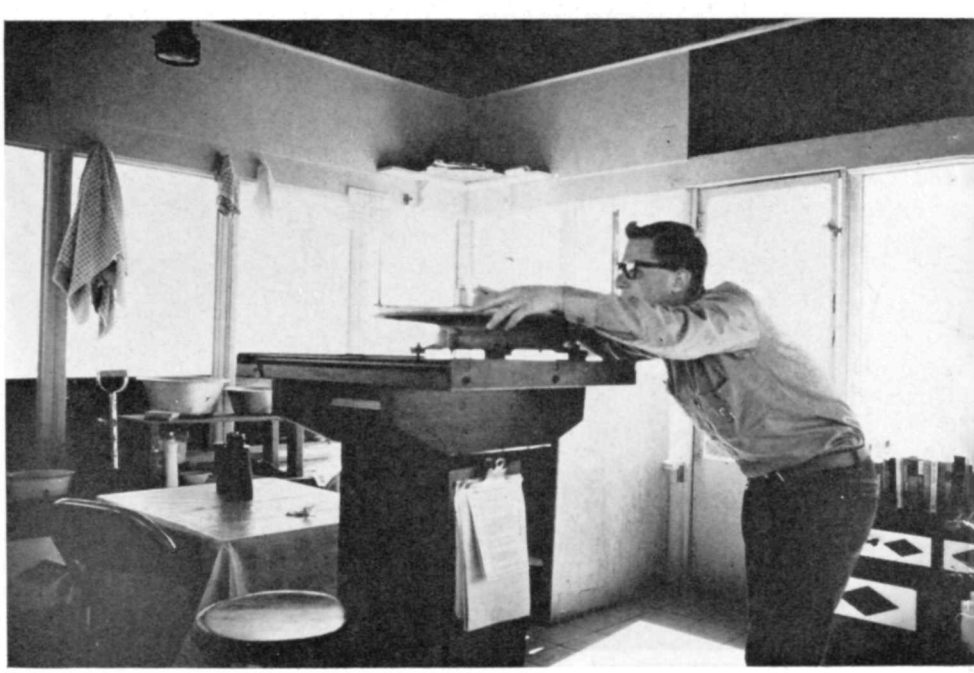
Our job was not only to search for, locate, and report forest fires. We were also part of the park's protection division, headed by the chief ranger. We had the responsibility of watching park roads and trails for emergencies or violations of regulations. The lookout also served as an unusual point of public contact, for here the interested visitor had a chance to sit down, relax with a cup of water, and find out as much about the park as he wanted to know—and we could tell him. An artist from California who had always wanted to see a thunderstorm from a mountain-top arrived one cloudy day and stayed about seven hours. He had his wish.

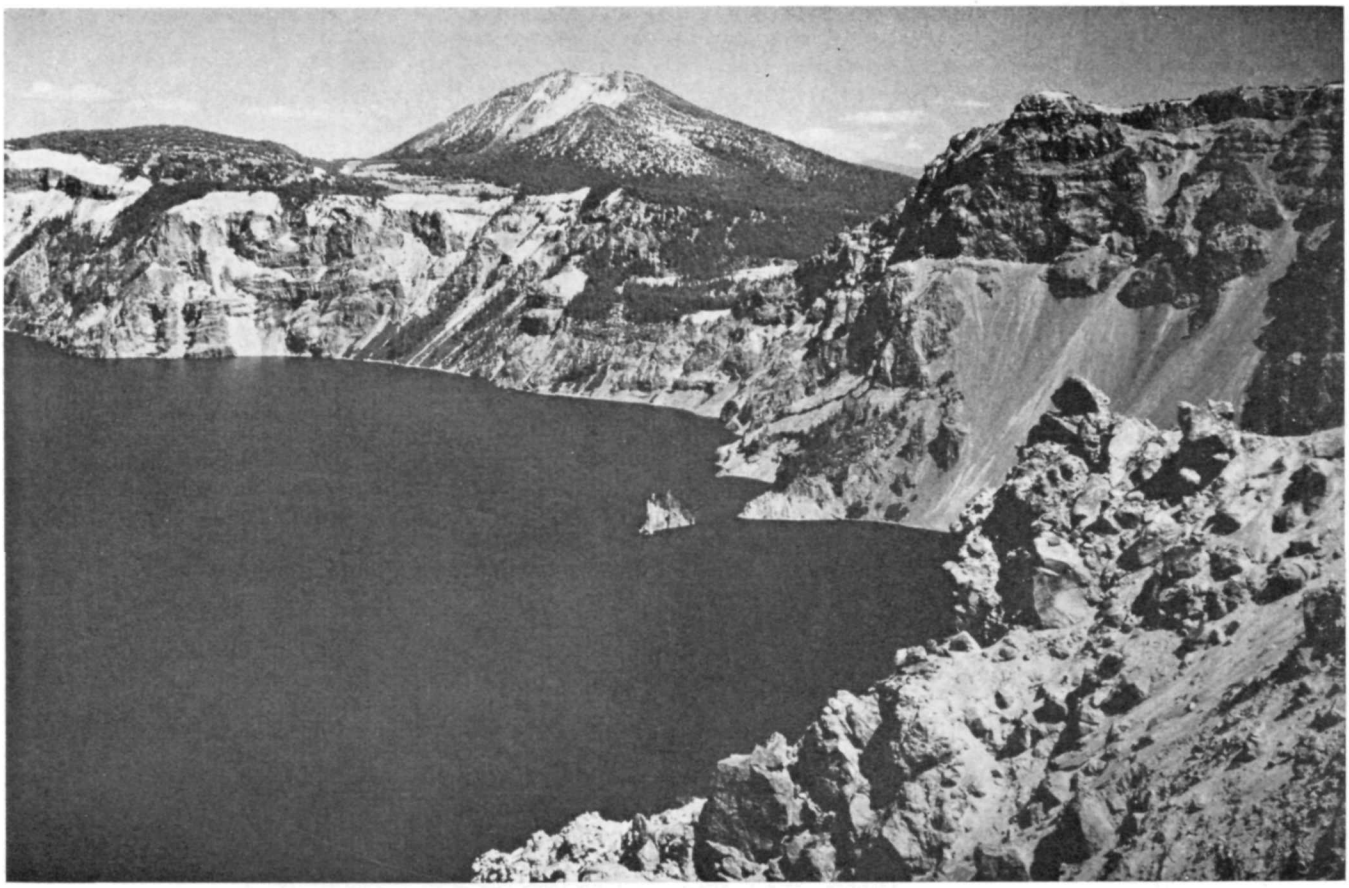
Being good fire lookouts involved learning certain skills, some of which we achieved the hard way. The morning after we arrived we saw a smoky column in the air about ten miles to the east. We thought it was dust because it was moving, brownish, and thin. But when big, dense puffs came up we changed our minds, and reported a fire. A few minutes later there was nothing to be seen. It *was* dust, and we were embarrassed. That day we learned our first on-the-job lesson: the lookout must learn to recognize smoke and distinguish it from dust, clouds, and the "legitimate" smoke sent up by mills, dumps, and factories. We learned to watch a suspected "smoke" until we were as sure as possible of its origin.

We maintained communications through a shortwave radio which enabled us to contact park headquarters, ranger vehicles, or an entrance station. We also had radios provided by two of the neighboring national forests, so we could be of mutual assistance in case one agency spotted a fire on the other's land. This cooperative arrangement was of value in many instances. We reported a fire in the Winema National Forest the same afternoon we received their radio set.

As lookouts, we had to learn the operations to be performed—and we had to learn fast. One day in July a severe thunderstorm had passed to our east about noon. The sky was still cloudy. We had, as usual, recorded the locations where lightning had struck the ground so that we could give those spots careful attention; a fire can break out even two weeks after lightning strikes, depending on when the smoldering tree has been dried sufficiently by the sun. About 3 p.m. we saw a dense column of white smoke drift upward from the heavily-forested valley three miles to our east, just outside the park

Peering through his alidade, Roy calculates the position of a possible fire.





The violent eruption and collapse of the gigantic Crater Lake volcano has been transformed into a serene natural lake against a backdrop of cliffs.

boundary. The first step was to get an alidade reading of the azimuth, determine the number of degrees from true north, and the vertical angle—the angle of a fire above or below a horizontal line drawn out from the lookout. When the smoke was sighted through the crosshairs, we used the map on the alidade's upper surface to determine the "legal location" of the fire—its township, range, and section, in surveyor's terms. We did our best to describe the fire's location in relation to local landmarks. When we had recorded all the required information on the proper form, we were ready to report our observations to the Forest Service:

"Queen 1 this is Queen 5-3, we have fire traffic for you."

"This is Queen 1."

"We have a smoke at 43° 26′, vertical angle-2° 13′, in Township 29 South, Range 5 East, in the northwest quarter of the southwest quarter of section 25 . . ." Within a half-hour two Forest Service "smoke jumpers" parachuted from a plane and circled the fire. When we looked out the window the next morning, the smoke had stopped rising.

Fire-Fighters in Action

In most cases, fires are reached from the ground, which is the way Crater Lake fire-fighters operate. A suppression crew drives along a fire-road—a dirt track through the woods—until they are near enough to the reported location of the fire to begin the often difficult task of actually finding it. They suppress the fire by digging a zone cleared of flammable material around the burning area, creating a "fire-line." If the fire is in one dead tree, which is frequently the case with lightning strikes, they fell the tree and check the surrounding area to make sure no offspring fires are present. If everything checks out, the fire is considered under control.

Our fire crews spent most of their time in "pre-suppression" work, reducing the danger of man-caused fires by removing flammable material from scenic turnouts, roadsides, and other heavily-used areas. This work, along with increased visitor education about fire prevention, rewarded us with no man-caused fires the entire summer. Much of the success was probably due to informal "lessons" by rangers on fire building. We had six small fires, but these were all caused by lightning.

Our fire-lookout summer is gone, but we will always carry with us an attachment for mountain-top life in Crater Lake National Park. We learned to appreciate the grace of wild animals and the strength of wild plants. We absorbed the majestic landscape surrounding us, and have since gazed upon nature's work with awe. Most of all, we will remember that summer with pride—we not only established a bond with nature, but helped to protect it. ■

News and Commentary

Sleeping Bear Lakeshore

Michigan's Sleeping Bear Dunes, long coveted as a prime recreational area by residents, has been under Park Service surveillance as a possible addition to the nation's park system. Fairly early in the 89th Congress, Michigan Senators Hart and McNamara introduced *S. 936*, to establish a Sleeping Bear Dunes National Lakeshore. On invitation by the Senate Committee on Interior and Insular Affairs, George H. Siehl, Assistant to the President of the Association, recently expressed his views on the proposed lakeshore before the Senate's Subcommittee on Parks and Recreation.

The Association favors the proposed lakeshore but feels that one section of the bill, authorizing land acquisition for a "scenic parkway" in the area, is destructive and unnecessary. The parkway would not only constitute a misuse of park land. but would require $9 million of the $14 million appropriation needed to acquire and develop the area. Mr. Siehl noted that roads already existed in the area for auto access to the lakeshore, and that hiking trails along the glacial moraine east of the lakeshore could be acquired by easement or purchase.

Hall Appointed to Commission

Leonard Hall, widely known author and conservationist of Caledonia, Missouri, has been appointed chairman of the Ozark National Scenic Riverways Advisory Commission. The appointment was recently announced by Secretary of the Interior Stewart L. Udall, who, under terms of the Act creating the riverways, was charged with naming the chairman of the Commission. In accordance with the Act, six other persons have been named members of the Committee; two by the Governor of Missouri, and four by the county courts of involved counties. The six are: Anthony A. Buford, of Clayton; Earl Buffington, of Summersville; Edward A. Hodge, of Eminence; Carl Seamen, of Eminence; Coleman McSpadden, of Van Buren; and Carleton E. Bay, of Salem. The newly appointed commission will advise with the Interior Secretary in matters concerning riverways development.

Monument to Miocene Mammals

The month of June brought the national park system a fine new monument of 3150 acres along the upper reaches of the Niobrara River in western Nebraska. Agate Fossil Beds National Monument will essentially be a scientific preserve, although it will also afford a cross-section of high-plains flora, fauna and scenery that many visitors will find quite charming. The locality has, for three-quarters of a century, been classic for the fossil remains of Miocene mammals, and has furnished outstanding specimens of that period of earth-history to many of the world's great museums. An illustrated article in the August, 1964, issue of *National Parks Magazine* summarized the human and natural history of the Beds, which the distinguished American paleontologist, Henry Fairfield Osborn, once called "the most remarkable deposit of mammalian remains of Tertiary Age that has ever been found in any part of the world." The Act of Congress creating Agate Fossil Beds Monument stemmed from Senate and House bills by Senator Hruska and Representative Martin, both of Nebraska.

Saving the C & O Canal

The C & O Canal Association, a group of hardy laymen and professional conservationists, is dedicated to the enjoyment and preservation of the old 185-mile-long Chesapeake and Ohio canal barge route, now protected as the C & O Canal National Historical Monument. For residents of the Washington, Maryland, and Virginia area, the canal preserve is an important refuge from urban pressures.

Each year the Canal Association holds a reunion banquet, but unlike some such occasions, this year's reunion served not wholly to bring old friends together for a chat. It was a time of thought and determination: the Association discussed the deep-drawdown dams proposed by the Corps of Engineers for the Potomac River Basin, noted that the dams would destroy the best parts of the canal, and determined to stand "shoulder to shoulder" with the National Parks Association in its efforts to substitute for the dams feasible alternative methods of solving

An Ocracoke Bridge?

NPA understands that considerable local pressure has been developing on Hatteras Island, Cape Hatteras National Seashore, for a Hatteras Island-Ocracoke Island bridge like the one that recently linked Bodie Island with Hatteras Island, to the utter ruination of scenic values on both sides of beautiful Oregon Inlet. The pressure is being generated, NPA is told, by businessmen on Ocracoke, who feel that a bridge rather than the present ferry would bring in more tourist money. Sentiment on the island, it is said, is presently about equally divided between proponents and residents who would like to see life on the island continue in its pleasant, unhurried pattern. Association members who remember the Bodie-Hatteras ferry-ride as a spicy forty minutes of salt-spray and laughing gulls may wish to write Governor Dan K. Moore of North Carolina, at the Capitol Building, Raleigh, and express their views concerning a possible Hatteras-Ocracoke bridge.

The Editorial Page

(*continued from page 2*)

The investigations being made by the Army Engineers should include studies of the two major alternatives for deep reservoirs, referred to by Straight and Raushenbush; there is no reason why they cannot be completed, by borrowing personnel from other agencies if need be, before next January 1, and be available promptly to Congress or other interested persons; such long-range investigations as the Engineers may have in mind can wait, but the deep reservoirs need immediate attention.

The long-range recommendations the Army Engineers make will not have much public support, and will probably have active opposition, if they contemplate any kind of a barrier in the west coast area of the park, jeopardizing the ecology of the park and the nursery grounds of the commercial shrimp population.

Nor will they have much support across the nation if they contemplate or lead to the construction of a road between the Florida Keys and western Florida, passing through the park, a project which would be ruinous to the park.

The American people have complete control over this situation. The purse strings for the further development of the Central Florida Project are in their hands. We surmise that the strings may not be untied very liberally until the Army Engineers and the Flood Control District are brought to heel.—*A.W.S.*

the water pollution problems of the Potomac River. The C & O Canal Association agreed with NPA's contention that ". . . The main purpose of these reservoirs is to flush pollution; the model program should prevent pollution at its source, not flush it afterwards."

Question of National Interest

The heavily-populated but still beautiful State of California houses much of the nation's irreplaceable natural treasures—abundant wildlife, quiet wilderness areas, golden beaches, and the majestic coast redwoods, found nowhere else on earth. These resources are, in a sense, the property of all Americans—especially the preserved redwood groves, bought with money contributed by individuals throughout the nation. But California has been lax in protecting its natural resources, depriving everyone of the use and enjoyment of these diminishing spots of natural beauty.

There have been recent indications, however, that protection of natural beauty within all States may be a prerequisite to Federal aid for the State under the new Land and Water Conservation Fund Act. Association President Anthony Wayne Smith recently discussed such a proposal with Dr. Edward C. Crafts, Director of the Department of the Interior's Bureau of Outdoor Recreation, and pointed out that "it is intolerable . . . that any state recreation plan should contain elements which directly violate national interests in that state, such as plans to thrust high-speed roads through national parks or national forests." Smith singled out as an example California's tendency toward building high-speed roads in recreational or natural areas such as the state redwoods parks or their watershed areas; the redwood groves in Sequoia National Park; and the proposed road through the heart of the condor nesting area in the Los Padres National Forest, which would probably doom the species to extinction.

To qualify for Bureau of Outdoor Recreation assistance, the recreation plans of all States should guarantee protection of the national interest. As Smith pointed out, "destructive overdevelopment by any State agency, particularly roadbuilding agencies . . . should be stopped at source by withholding highway funds and recreation funds until the State comports itself with the national interest."

Wilderness vs. Canals

The flat and fertile land of Florida has lost much of its wilderness charm to heavy industry and overdevelopment. Such overdevelopment threatens not only Everglades National Park, but other prime wilderness areas and wildlife habitat such as the Oklawaha wilderness country, part of which is in the Ocala National Forest. For some time the Corps of Engineers has been planning a Cross-Florida Barge Canal, which would cut a sixty-mile gash through the area; destroy untouched swampland and hardwood forests; inundate vital habitat for

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Fern Canyon and Gold Bluffs Beach Acquired for California State Park System

During May of this year the Save-the-Redwoods League, Pacific Coast conservation organization with headquarters at 114 Sansome Street, San Francisco, reached a long-time objective with the purchase from the Pacific Lumber Company of the celebrated Fern Canyon and 2000 acres of coast redwood forest in Humboldt County, California. The acquisition included the spectacular Gold Bluffs beach along four miles of the Pacific shore at the west boundary of Prairie Creek Redwoods State Park. The announcement was made by President Ralph W. Chaney of the League, President Stanwood A. Murphy of the Pacific Lumber Company, and by the California Department of Parks and Recreation. All three agencies took part in the negotiations.

Under the agreement reached, 30 acres, including Fern Canyon, are a gift from the lumber company to the State, which took immediate title to 500 acres. The League acquired 1000 acres and contracted to purchase an additional 500 acres within the next two years; the League will raise half the cost of the purchase.

The entire area of 2000 acres, which will become part of Prairie Creek Redwoods State Park, is one of the high priorities in the state park program recommended by Governor Edmund G. Brown in his 1965-66 budget. The sum of $5,000,000 in State funds to match the League in acquiring the Fern Canyon and other properties will be necessary to assure completion of the project. The League has raised more than $10,000,000 from contributors all over the country since 1918, when the organization was founded. These funds have been matched by the State of California to purchase more than 100,000 acres of coast redwoods (*Sequoia sempervirens*) now in 28 state redwood parks; over 50,000 acres are in virgin redwoods.

At left: Fern Canyon, a gem-like natural corridor between Gold Bluffs beach and coast redwoods of California's Humboldt County.

turkey, deer, bear, and other large animals; ruin fishing in the now-clear Oklawaha River—which has been chosen for possible inclusion in a nationwide system of wild rivers—and, as Florida's *Gainesville Sun* put it, "replace beautiful, tropical river conditions with dead trees and snags and a shallow still-water area."

A Progressive Policy

The Humble Oil and Refining Company, an affiliate of Standard Oil of New Jersey, has announced that it will invest $200,000 this year in a new facility at its Baytown, New Jersey, refinery for cleaning sea water of oil before the water is run back into the sea. This affiliate has spent some million dollars over the past 20 years in helping reduce air and water pollution stemming from company functions. Although international regulations currently permit discharge of oily sea water from tankers at prescribed distances from shorelines, Humble Oil fleets retain the oily waste-water aboard ship for later treatment at on-shore refineries; this effluent from tank-cleaning operations is discharged at sea only when the safety of the ship and its crew are at stake. Humble officials have stated that, in their opinion, 95 percent of sea pollution by oil could be eliminated if such procedure was adopted by other oil companies.

Conservationists will hope that the fine examples which are being set by Humble Oil and its parent company, Standard Oil of New Jersey, will be picked up by all companies that operate tanker fleets.

Mine Acids and Our Rivers

Acid pollution of the nation's rivers, much of which is caused by acid-water drainage from coal mines, may soon come under intensive study by the United States Public Health Service. The Service is now seeking funds for three projects to determine the most satisfactory and effective method of controlling acid pollution, such as that which occurs in the Potomac, Susquehanna, and Allegheny River Basins as a result of drainage into the rivers from Appalachian coal mines. Chief Public Health Service Pollution Control Officer Gordon E. McCallum has said that acid drainage is commercially damaging because it destroys fisheries and discourages new industry. Acid water drainage also, of course, ruins esthetic and recreational values in affected areas.

Trees for New York City

One comment that flushes the face of the true New Yorker is the murmured contention of an out-of-towner that "New York is fun to visit, but I wouldn't like to live here." And many New Yorkers, cooped up in their concrete cages amid the noise and fumes of the big city, often agree.

Some relief seems to be on the way, however. The newly-formed, non-profit "Salute to the Seasons Fund," located at 405 Lexington Avenue, New York, N.Y. 10017, aims to spruce up New York City with hospitable greenery that could, if managed properly, change the barren atmosphere of the city and make it a more enjoyable abode. The Fund urges husbands to "tell her you love her by planting a tree on your street," and informs New Yorkers how they can purchase a tree and thereby enhance the beauty and commercial value of their neighborhoods. When an individual decides to buy a tree, the New York City Park Department inspects the location, helps him select the type of tree he wishes to plant, and tells him which nurseries do the planting. The nursery will maintain and guarantee the tree for one year, after which the Parks Department sprays and prunes the green treasure—free. If the tree is obtained through the Fund, costs are tax-deductible.

Each of New York's five boroughs has a Department of Parks to supply aid and information concerning tree-planting.

Story of Sylvania

Tucked away at the western end of Michigan's Upper Peninsula lie 14,000 acres of virgin forests, crystal lakes, gem-like ponds, and a varied population of native wildlife, including the rare bald eagle. This virtually untouched wilderness is called "Sylvania," from a Latin word meaning "of the forest."

In the early 1900's Sylvania served as an exclusive hunting and fishing club, and is now the private domain of outdoorsmen, who wish to dispose of the property. The Forest Service, it is understood, hopes to purchase Sylvania and preserve it for public enjoyment.

Sylvania is within the Ottawa National Forest; its southern boundary runs for six miles along the Michigan-Wisconsin State line, although the area itself lies entirely within Michigan's Gogebic County. According to a recent study of Sylvania, published by the School of Natural Resources of the University of Michigan in conjunction with the Forest Service, the pristine area is close to many major cities and within a day's drive of a large segment of the area's outdoor-seeking population. Its north woods, lake country atmosphere offers a variety of experiences such as camping, canoeing, birdwatching, fishing, scientific study, and other related wilderness enjoyments.

To the Forest Service, "Sylvania does indeed offer great opportunity for public development and use." Although the Service, in its report, mentions that overdevelopment must be avoided, it is clear that management of the area would be on the usual multiple-use basis, with timber cutting, various silvicultural "controls," and some development for heavy recreational use. Blacktop roads, an amphitheatre, and lake shore structures are planned for Sylvania. The Forest Service has generally done an excellent job in managing its lands, and the public is grateful for the Service's wise use of natural resources. Conservationists hope, however, that if the Service does buy Sylvania, the highest standards for wilderness protection will be applied to preserve a majestic area for use by America's overcrowded, city-weary population.

Reviews

THE MYSTERIOUS SENSES OF ANIMALS. By Vitus B. Dröscher. E. P. Dutton & Company, 201 Park Avenue South, New York, N.Y. 255 pp. Clothbound, $5.95.

Since the first caveman snared a wild dog and clumsily trained it to sniff out game, man has been aware that animals possess special "senses" lacking in humans. Mr. Dröscher calls these senses "mysterious," but it is only man's almost fearful ignorance about such phenomena that causes him to attach an air of mystery to them. Once understood, the special senses of animals are seen as marvels of nature's ingenuity which man can only observe with awe, and perhaps adapt to suit his own needs.

Poet Walt Whitman often noted the wonder of animal senses, and declared that nature was highly superior to the machines employed by man. Mr. Dröscher's book seems to substantiate this contention; the book is described as one which "introduces to the lay reader a remarkable world where nature at every turn has seemed to rival, indeed often surpass, the inventions of man."

The remarkable natural abilities of many species of animals make up only one part of this fascinating book. The discussions of biological idiosyncrasies are in themselves enough to classify the volume as a work of importance. But to the discerning reader another more subtle point is uncovered: animals have definite and permanently established moral codes, at times far superior to man's. Most kill only when necessary for survival, and many display a tender unselfishness toward their fellows that puts human morality to shame. Their intelligence as they follow nature's ancient rules becomes obvious; they not only adapt to, but preserve their environment—a feat which humans have not yet mastered. As one zoologist working with dolphins remarked, "If the dolphins had been trying to make contact with us all these years, they would certainly have been greatly disheartened by our stupidity."

HOME IS THE DESERT. By Ann Woodin. The Macmillan Company, 60 Fifth Avenue, New York, N.Y. 247 pages, Clothbound, $5.95.

During the course of our everyday lives, when we dream of a natural oasis in which to escape the crush and noise of the city, we rarely think of the desert as a desirable retreat. "The desert is dead," most urbanites say. "It has sand and sun and empty horizons; few creatures make the desert a home."

Ann Woodin, her husband, and her four jovial sons know better. In the Arizona desert near Tucson, where Mr. Woodin directs the Arizona-Sonora Desert Museum, the desert is not only home but a fascinating world of strange and interesting animals, spectacular scenery, and never-ending natural delights.

What are the advantages of such a life? Mrs. Woodin states it clearly: her boys can roam freely to develop individuality and learn that life is a shared experience not only with humans, but with all creatures of the earth. One day, nine-year-old Michael looked at his mother and mused, "I wouldn't like to live all hunched up in a city like a grain of sand on the beach. I just couldn't bear it."

Exceptional photographs of the boys with their wild-animal friends, fascinating facts about these friends, and an enjoyable writing style combine to make Mrs. Woodin's book an excellent vehicle for her basic contention, in respect to animal-human relationships, that "With a wild animal there is no question of ownership . . . it is an equal affair, equally given. To watch a bobcat and a small boy climbing around in a tree together, to sit by the edge of a stream and share a sandwich with a raven, to shiver beside a coyote because the night is wet and cold, is to be reminded that we are all entangled in the long dark sigh of life, which is at once a wonder and a comfort."

THE CONSERVATION DOCKET

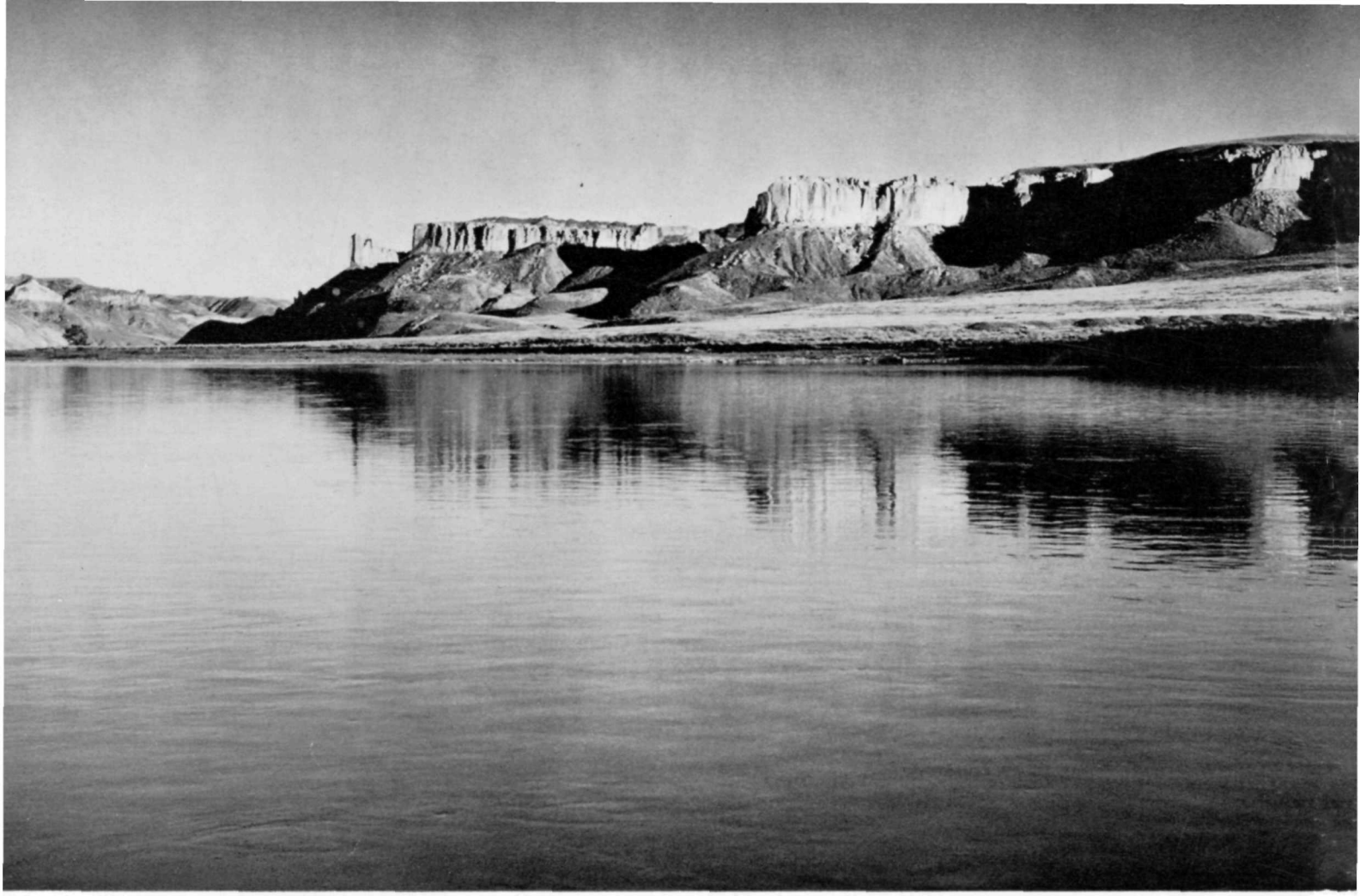
Construction of Bridge Canyon Dam on the Colorado River, at the headwaters of Lake Mead west of Grand Canyon National Park and Monument, has officially been dropped from consideration for the next five years. The dam is proposed by the Bureau of Reclamation for inclusion in the Pacific Southwest Water Plan. Widespread concern over damage to the park and monument, and the availability of a feasible, non-destructive alternative plan to provide water for the arid southwestern states are reported to be factors causing officials of the Bureau of the Budget to suggest to Interior Secretary Stewart L. Udall a five-year moratorium on construction plans.

Representative Mathias has introduced H.R. 9366 to establish a Chesapeake and Ohio Canal National Historical Park. The area, now a historical monument, lies within Maryland and West Virginia on the Potomac River. H.R. 9366 contains a provision which would allow use of the recreational area for "public nonpark uses" were such uses considered desirable.

Establishment of an Indiana Dunes National Lakeshore, long hoped for by Senator Paul H. Douglas and many others, came a step closer to enactment when an enabling bill passed the Senate on June 21. The bill has gone to the House for further consideration.

Senators Metcalf and Hruska have introduced S. 2192, which would amend the Migratory Bird Conservation Act. The bill forbids the sale or transfer of land within the national wildlife refuge system without the approval of the Migratory Bird Commission. The bill has been referred to the Senate Committee on Commerce.

H. R. 9424 was introduced on June 23 by Rep. Thompson, to "provide for the conservation, protection, and propagation of native species of fish and wildlife, including migratory birds, that are threatened with extinction. . . ." The bill has been sent to the Committee on Merchant Marine and Fisheries of the House of Representatives.



Photograph by Gilbert F. Stucker

The shimmering waters of the Missouri River move gently beneath the fragile ramparts of Hole-in-the-Wall, a maze of delicate, wind-carved sandstone hills and ridges along the route of the proposed Lewis and Clark Wilderness Waterway. Boaters explore its multi-colored arches and spires with care; the soft, natural carvings may crumble under a rough hand. The scene today looks much as it did when Lewis and Clark saw it during their historic expedition of 1803.

IN 1804, WHEN LEWIS AND CLARK SET OUT in their purposeful little fleet to explore the Missouri River of the untouched western United States, they came upon natural sights so beautiful that Lewis could only describe them breathlessly as "scenes of visionary enchantment." These scenes, among them the one above, are still there, beckoning to modern explorers who yearn for closer communion with nature's works of art, gently preserved through the centuries as visible examples of natural America.

A MAJOR AIM OF THE National Parks Association is to study, evaluate, and help preserve scenic and scientifically important natural areas for the education and enjoyment of today's Americans and the generations to come. You can help the Association in this work by raising your membership classification; securing new members; or by contributions to the general funds of the Association over and above your regular membership fee. Such contributions are deductible for Federal taxable income.

National Parks Association

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