NATIONAL PARKS *Magazine*

Canyon de Chelly and trail to White House ruin:
Canyon de Chelly National Monument, northeastern Arizona

July 1965

The Editorial Page

The Potomac Again in Danger

STEWART L. UDALL, SECRETARY OF THE INTERIOR, STANDS in great danger, as we go to press, of letting the grandest opportunity in conservation history slip through his fingers: the chance to develop a model program for the Potomac Basin.

This would be a tragedy for the people of the Potomac, for the Nation, and for the Secretary himself; it would defeat the purposes the President of the United States presumably had in mind in referring the problem to the Secretary.

It is no longer a secret that the planners to whom the Secretary has entrusted this responsibility are seriously considering the revival of 8 or 10 of the 16 major reservoirs which are part of the discredited Army Engineers Program.

The powerful coalition of farm, labor, conservation, and citizens organizations (numbering some 7½ million members) which supports the President's call for a Model Program and opposes the Army Engineers' plan cannot possibly support such a revival under the guise of a model program.

The tragedy is partly that the Secretary seems to be much impressed with the potentials of modern technology for dealing with river basin management on a completely new basis; yet his planners are looking backward to the good old days when all these problems could be handled by big-reservoir storage.

The tragedy is further that the available talent in the Departments of Agriculture and Interior is abundantly capable of providing the modern alternatives to the old-fashioned big-reservoir system. But the men who know how to use these new techniques are not being heard in the planning councils.

The Governors of the Basin States and the Commissioners of the District of Columbia will meet as a Governors' Advisory Committee to the Secretary on June 28. The only plans which are at present ready for submission for the consideration of the Governors are the plans which contemplate the construction of 8 or 10 of the major reservoirs proposed by the Army Engineers. The general outlines of these plans have already been made public; the great potentials of modern technology for water resources management are not sufficiently reflected in these plans; the major alternatives to the big-reservoir system do not sufficiently appear in these plans. The Governors and the Commissioners are an able group of leaders, with heavy public responsibilities, and they will not, we surmise, be misled by inadequate staff preparations.

The defenders of the Potomac River Basin will have convened by the time we are in print, in an emergency session of the Citizens Conference on the Potomac River Basin in Winchester, Virginia, on June 26, to renew their endorsement of the President's call for a model program for the Potomac, their endorsement of programs for the eradication (not dilution) of pollution, and the development of a network of small headwater impoundments. Their views will presumably be available to the Governors.

A grave administrative error has been made by the Secretary's associates in assigning planning for flood control and water supply to the Army Engineers, and for pollution abatement to the Public Health Service, which is committed to the system of storage for the dilution and flushing of pollution; how anything other than revival of the Army Engineers' plans could come out of such an assignment we fail to understand; what has come thus far is precisely such a revival.

Fortunately, the Secretary still insists that no final decisions have been made; we hope that a strong, vigorous course can be charted promptly in the direction of a genuine model program.

The major outlines for a model program for the Potomac have been very clear for a long time.

A model program, first of all, will mean, in the words of the President, that we should clean up the river and keep it clean. This means that pollution must be kept out of the river, not flushed and diluted afterwards; no major storage reservoirs are needed for this purpose.

The Federal Water Pollution Control Act of 1965 has been passed by both Houses of Congress; presumably, within a matter of weeks it will be signed by the President, and the new Federal Water Pollution Control Administration will have been established in the Department of Health, Education, and Welfare. The major responsibility for water pollution control will have been transferred from the Public Health Service to the Water Pollution Control Administration; this Administration will have broad authority to act with energy and decision to eliminate pollution from the Potomac and our other great river basins. This is the way to get the de-pollution job done; big reservoirs are not needed. In view of the President's great interest in water pollution control, he will presumably

(continued on page 20)

The Model Program for the Potomac Needs Your Help!

Readers who think that water resources of the Potomac should be managed by the complete elimination of pollution and by the headwater storage system, and who are opposed to the 16 major reservoirs promoted by the Army Engineers can express themselves on the subject, and help a righteous cause, by writing to The President, The White House, Washington, D.C., commending him on his call for a model program, and expressing their views on the subject.

NATIONAL PARKS *Magazine*

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Front cover photograph by Darwin Van Campen

The many ruins found within the several canyons of Canyon de Chelly National Monument, which is located on lands of the Navajo Tribe in northeastern Arizona, tell the long story of human occupation in the plateau country of the American Southwest during prehistoric times. The story is a complex one, reflecting the changing patterns of Southwestern life over a thousand years; it is necessarily a hazy record, and one that is yet far from complete; but it stands, as one southwestern writer has said, as a "pageant of romance and color." The monument that preserves the Canyon de Chelly story was brought into the national park system in 1931.

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.

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Roadbuilding in Mount McKinley National Park

By Adolph Murie

Photographs by the author

FOR THIRTY YEARS there has been a road, nearly ninety miles long, leading through the heart of Alaska's Mount McKinley National Park. My acquaintance with this road goes back twenty-six years, and I was there earlier, before any road construction had commenced. I have, perhaps, driven the park road as much or more than any person in or out of the National Park Service. This does not necessarily make me an authority on the park's road needs of the future; but it does indicate that I am acquainted with driving conditions on the old thoroughfare and with the nature of its traffic. And always I have been interested in the esthetics involved—enough so that I have meddled a time or two in road matters. On one occasion I meddled, with results, when the maintenance crew needlessly commenced to destroy the many miles of beautiful and spectacular fireweed bordering the road. Now I am meddling again. This time I feel I am speaking for a host of people interested in park values, and who are opposed to the new road construction in Mount McKinley National Park.

The Old Park Road

The old park road was built on a shoestring, so to speak, in a day when financial limitations were severe. Hence the engineering standards were charmingly simple, and they have been adequate up to the present time, including the last eight years or so in which the Denali Highway has connected the park road with the Alaska highway system. And the standards are, according to non-official circles, almost adequate for the future.

The old road lies upon the tundra and follows its moderate undulations; there are many curves that open up many new and intimate vistas. In two sections of the road there is some rock-work. The speed limit is 35 miles per hour; less, of course, in a great many places. But the road is, I suppose, what one would call a top-speed 35-mile-an-hour road. An official in a hurry could travel from headquarters to Wonder Lake in less than four hours. There is no feeling that the road is too slow, for it is so delightful that it destroys the usual motorist's impatience. Never have I heard a complaint about the slowness of the road. Always the reaction has been, "I hope the powers-that-be will know enough to leave the road alone."

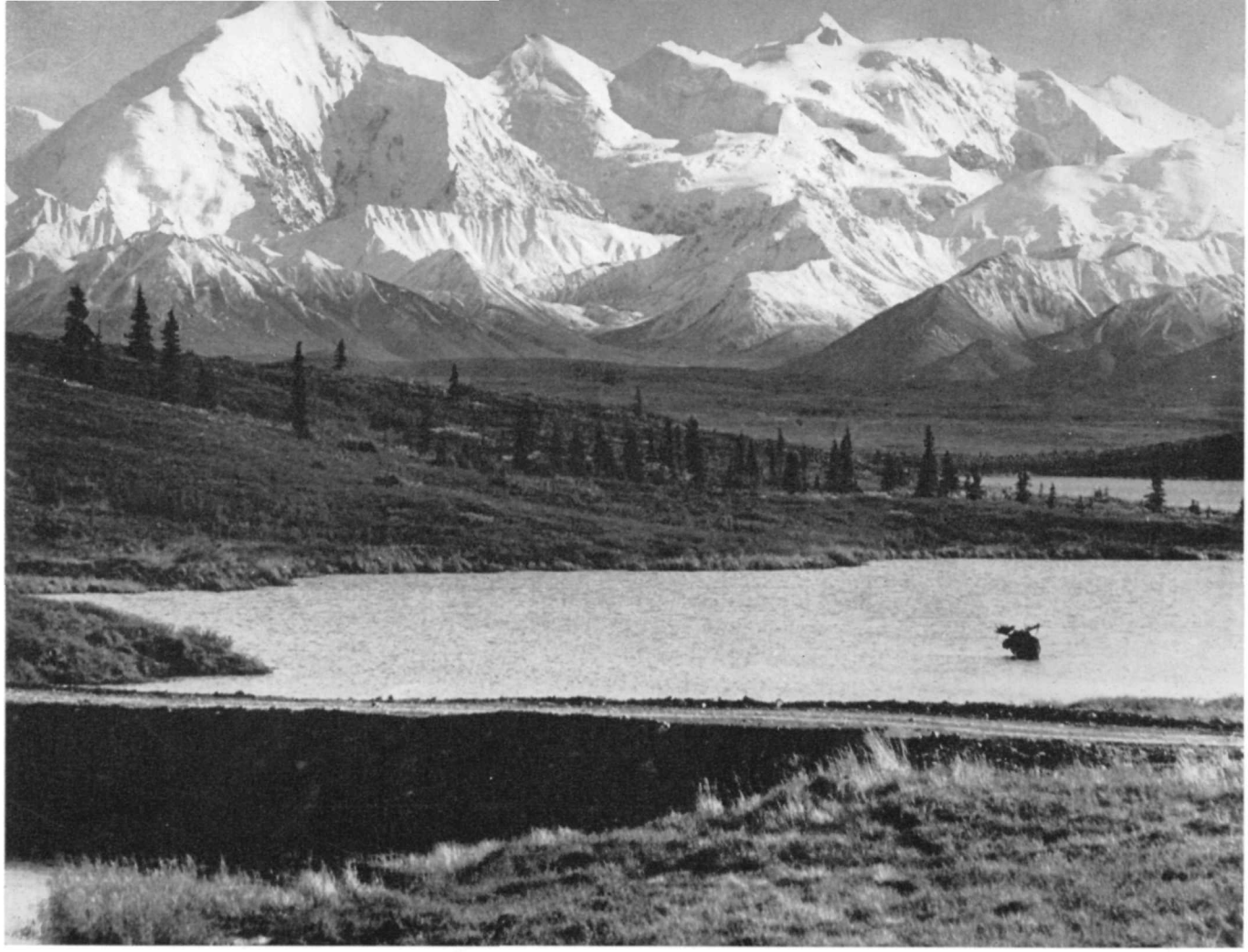
The width of the old road, with its shoulders, is about 25 feet, and most of the width is drivable. This high efficiency derives from the fact that the roadbed is not built up—the surface is about level with the adjacent terrain. The roadbed has remained firm through the years, even though relatively little gravel was used in its construction. Quick spring run-offs have at times washed out small pieces of the road, but, because it was not built up high, repairs were of a very minor nature. Whatever permafrost—presence of which is sometimes used as an excuse for very high gravel filling—exists under the road seems to have had little effect on it.

By accident, by inadvertence, the old road was built within a framework ideal for furtherance of park enjoyment. The road standards could not have been better developed by expert non-engineers. In saying this, I intend only the highest praise. But the blessing of a road with a tempo in harmony with the enjoyment of flowers, lichens, wandering tattlers and grizzlies has apparently gone unrecognized, though its mood has charmed all visitors seeking the sublime.

For example: in 1960 one tourist, in discussing the park road, said that he had spent a long day driving to Wonder Lake from park headquarters, and had stopped dozens of times along the way to look, to watch. He said he had felt unhurried, that all travel was slow and leisurely, and that it had been an adventure he would never forget. But he said that the first stretch of road to Savage River (the finished part of the new highway at that time) was sophisticated, like any other superhighway outside the park, and that he speeded on it like the rest of the cars, and was glad to get over it.

Through the years I have talked with many other park visitors, including professional photographers, conservationists, campers, laborers, temporary park employees, Alaskans, non-Alaskans, scientists, artists, and outdoor people of all kinds. Before the road reconstruction they had a high opinion of the manner in which the Service had administered the park; modernity had not yet intruded and the park road was geared to simplicity.

It was obvious to all that the charming old road would need some refurbishing when it was connected with the Alaskan road system. There were a few blind corners that



This majestic scene in Mount McKinley National Park seems to warrant more esthetic consideration than it received during park road reconstruction. A small picturesque wooden bridge might have been more appropriate than the long gravel fill, with its three homely steel culverts.

should have been removed years ago, and over stretches here and there a slight widening seemed desirable, especially beyond Mount Eilson. This could have been done in the spirit of the old road, and within its standards. One road-man said that he could give the old highway the refurbishing it needed in one season, with an earth-mover and a bulldozer or two. He might have been over-optimistic—perhaps two or three seasons would have been needed. In any event, his opinion was an indicator of the amount of work needed from the point of view of a road-man.

The New Highway

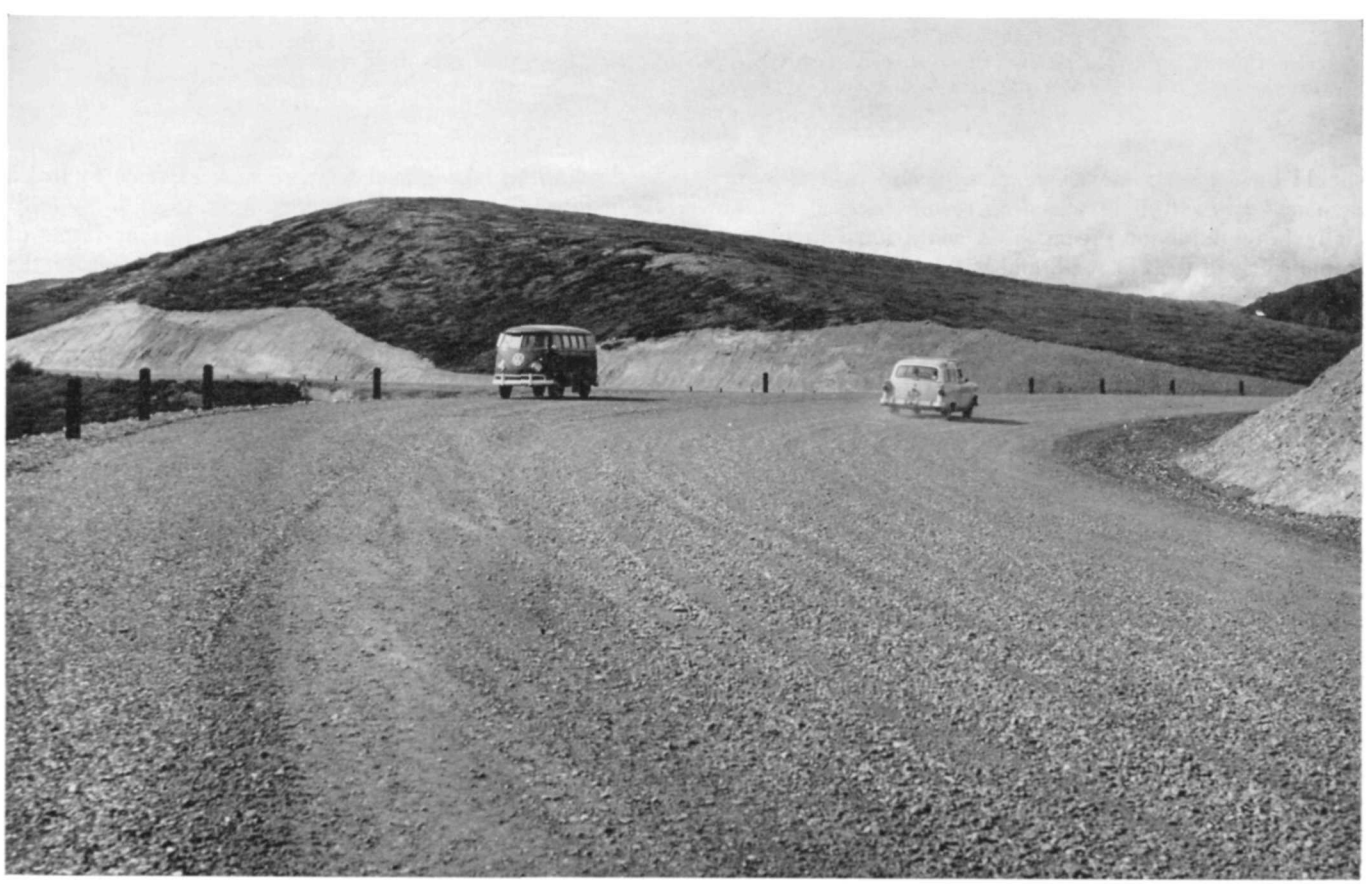
In 1959, a twelve-mile stretch of new highway was built following the route of the old road. But the charm of the old road had been obliterated, having been buried under many feet of gravel, which extended far out on either side of the old bed. Instead of refurbishing an old road that had encouraged leisurely travel through a primitive country, the engineers had built a highway with specifications equalling those of the fastest highway standards. Instead of a roadbed level with the adjacent terrain, bordered and partially hidden by shrubbery and fireweed, the gravel bed now shows several feet *above* the shrubbery even on flat stretches of terrain, and is visible from afar. In depressions, the gravel fills are now extreme to avoid slight dips. The new highway *dominates*.

The public has commented on several further facets of the road refurbishing. Thus, wooden bridges across the streams would have been more appropriate than ponderous concrete structures. Replacement of the wooden bridges crossing small streams with huge steel culverts has been deplored by many. At Wonder Lake a wooden bridge formerly crossed a stream where it entered the lake, a picturesque spot from which to view Mount McKinley. Instead of replacing this bridge with another of attractive design, three homely steel culverts with a broad gravel fill were installed by the roadbuilders—planning especially vulgar. One might also mention the needless, unsightly, bulldozed gravel dikes that hide Igloo Creek, a roughshod and crude treatment.

Some people had hoped that more moderate engineering standards would be followed beyond Savage River; but, in 1960, the roadbuilding destruction between the Savage and Sanctuary Rivers was more drastic than that on the first stretch built in 1959.

Upkeep of the new construction, because of the high gravel fills everywhere, will be excessive. Already fills at small bridges are washing, and will need major repairs.

Above, a view of the charming old park road that is currently being reconstructed to high standards. The old road served its purpose well, and needed only a modest amount of refurbishing—a little widening and a few inches of gravel surfacing. The old road was affected by permafrost in only two or three spots. Below: a sophisticated highway, which has already superseded a portion of the old road, has been called "official vandalism." Its road-cuts have been compared with the earth-cuts that were made by the glaciers of the last Ice Age.



Beds of streams on both sides of the bridges are being bulldozed and diked for distances up to three or four hundred yards, creating unsightliness. One or two fills are sloughing away because of their height and steepness. Major cuts in slopes are gullying and sloughing down on the road.

In the autumn of 1964, a major project bloomed along the new road. A crane dragging a monstrous "flatiron" back and forth across the gravel was used to iron out gulleys on slopes. The slopes were then seeded with three kinds of exotic plants, and covered with tons of hay full of foxtail and other weeds and exotic species. This planting was also carried out on a huge gravel pit created during road construction. Here was an attempt to cover one mistake with another.

Opinions on Standards of the New Road

One of the officials of the Bureau of Public Roads stated that the standards of the new construction were "a hell of a lot higher than needed." But then he added that high standards were needed to carry the heavy road-construction vehicles!

One park official said that the Service had to try to compromise between the Bureau of Public Roads and the conservationists. Another park official said that if the standards for the new construction could be held down to the present standards we would be doing well; that he was satisfied with the current standards. He pointed out that the park was doing all it could to keep large vehicles from wandering out on the tundra in the roadbuilding process; a case of feeling virtuous over a relatively trivial matter. I have talked with some high Service officials who were quite indignant about the road, but who apparently felt helpless.

And the public? One and all who I contacted denounced the current excessive engineering standards. Many even said that the old road was good enough, even without improvement. Their attitude was one of condemnation.

So the road situation in Mount McKinley Park is today a strange one. The public, for which parks are set aside, appreciates the qualities of the old road, which the Park Service is now destroying, and the public is disheartened and resentful.

Fundamentally, it is a mistake to permit engineers to impose their values on park developments. To an engineer, the road is the sole end. Beauty lies in a road built as straight as money will permit, with curves allowing the greatest speed with the greatest ease. Road-base specifications are on the fully ample side, beyond actual need. The modern freeway is the epitome of the desirable. Therefore it is understandable that the engineer is unable to comprehend that, for the public, park roads are secondary to park values, and should be made as unobtrusive and simple as possible.

The top man in park road planning should, it would seem, be a non-engineer; an individual who recognizes that the preservation of the mood and spirit of a preservation is of primary importance. The engineer should be told what is wanted, and it should be his job to follow instructions; to build or refurbish the simple road desired. And he should be fully impressed that the only erring tolerated would be in the direction of simplicity. We need revised thinking in road planning for wild country.

The Current Situation

In the April, 1963, issue of *National Parks Magazine*, Olaus J. Murie published a highly critical article on the McKinley Park roadbuilding, illustrated with two road pictures and one of the visitor center at Mile 65, a structure known to some as "the Monstrosity," or "the Dairy Queen." In the May, 1963, issue of the same magazine Tilden and Machler published another critical article on the new road construction. Criticism by visitors was still intense. By the fall of 1963, about 26 miles of superhighway had been built.

In October, 1963, Robert Galati, who had spent the summer in the park with his family, wrote a letter concerning the road to Secretary of the Interior Udall. He pointed out that, although the posted speed-limit in the park was 35 miles per hour, many cars travelled 60 miles per hour on the new highway (creating, the author will add here, a dust problem). Galati wrote that "The beauty of the rolling tundra was marred by this superfluous man-made creation."

In a letter dated during January, 1964, the National Park Service replied in part as follows:

"We are convinced from our observations that the standards of road resulting from improvement of the first 30 miles [should have read 26 miles—*author*] has resulted in a road development that is somewhat in advance of current traffic needs."

At the time the photograph below was taken, extensive bulldozing for the new park road was taking place on a dry stream-bed above a small bridge with high gravel approaches. Most conservationists, and also most park visitors, would doubtless feel that defacement of this kind is unnecessary under any circumstances.

An extensive borrow-pit, created during construction of the new park "superhighway," is being planted to control erosion. The ground is being covered with hay full of foxtail and other exotic plant seeds—an effort to obliterate one mistake with another, in the opinion of the author of this article.

The letter then proceeded to describe a plan for a reduction of standards which would be made in two steps (telescoping) for the road construction beyond "the end of the present construction work." Those of us who saw copies of this reply were pleased that the National Park Service was at last responding to the public outcry. No new road construction took place in 1964, except for the installation of about two dozen culverts in a stretch of road that had already been recommended and approved.

In January, 1965, I wrote in part to the Director of the National Park Service:

"There have been reliable reports that the U. S. Bureau of Public Roads is still submitting plans for highway building in McKinley, using superhighway standards, and that they have submitted an estimated expenditure of over $500,000 for the next 3½ miles of construction . . . on a road that has functioned for many years and which, in places, is similar to sections of highway in Yellowstone Park carrying millions of visitors. Does this mean that the Bureau of Public Roads has not been asked to build a simple road?"

In an unsatisfactory reply to my letter the National Park Service informed me that the estimated cost of 4.9 miles of contemplated new construction was $603,000 and that the same high standards would be used. Continuation of the same high standards for the additional construction does not agree with the statement to Galati that standards would be reduced "at the end of the present construction work" that was finished in 1963.

My opinion is that the National Park Service wishes to continue using the highest-standard road construction all the way to Wonder Lake. Its engineers seem convinced that the pretentious road they have so far built is appropriate, and I fear the roadbuilders will continue to move forward with superhighway construction, using a sort of *fait accompli* policy. It seems to me that if the Service sincerely believes that the already finished construction has been too elaborate and destructive, it would not wish to continue the desecration.

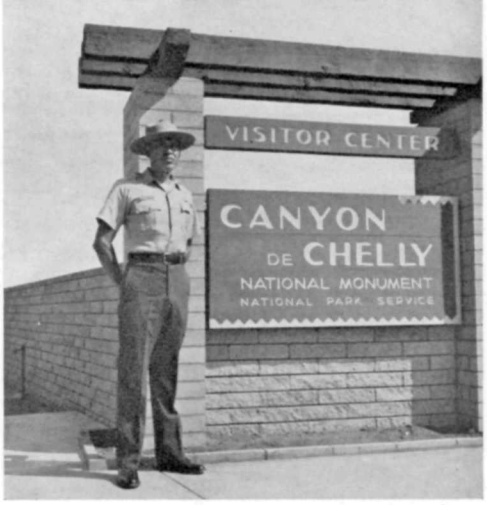
Summary and Recommendations

Public opinion is unanimously against the superhighway character of the road construction currently taking place in Mount McKinley National Park. The gravel roadbed is excessively high and excessively wide, and is creating a conspicuous scar over many miles of landscape. This drastic rebuilding of the old road shows an obsessive regard for superhighway standards and a lack of appreciation for the spirit of this northern wilderness.

The public regards the old road in the park as charming, and feels strongly that a refurbishing within the framework of its standards is all the construction that is needed and desirable. The road should be left lying on the ground with only a slight widening.

Road standards in national parks should not be determined by the Bureau of Public Roads, or park engineers, but by non-engineers selected for their appreciation of park ideals and their sensitivity to esthetic values.

The park is largely above timberline and therefore is easily marred; we are dealing here with precious wilderness qualities, and the delicacy and purity of the mood in this park requires a delicate touch. If this fact were recognized, the Park Service could dispense with the recruiting of an army of bulldozers for the renovation of that part of the old park thoroughfare yet remaining. ■



At left, Canyon de Chelly Monument seasonal park ranger Clarence Gorman, a Navajo Indian. Many Navajos have evinced a deep interest in the past human history of the plateau country of the Southwest, and have assisted the National Park Service in its archeological "digs" and studies.

Nature and Man in Canyon de Chelly

By Meredith M. Guillet

Photographs courtesy National Park Service

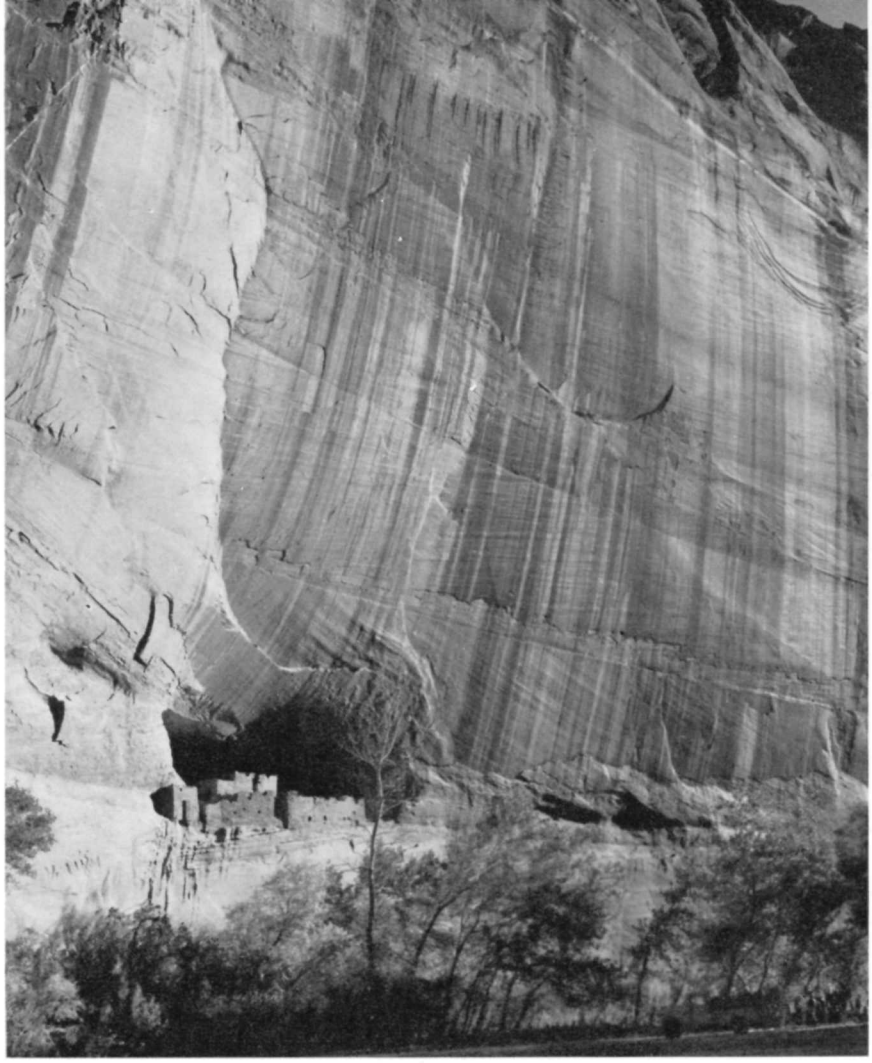
As the haze that has enveloped the geological and archeological past is penetrated more and more deeply by scientific investigation, many parts of the country formerly of interest mainly to the specialist assume greater meaning for the thoughtful lay American.

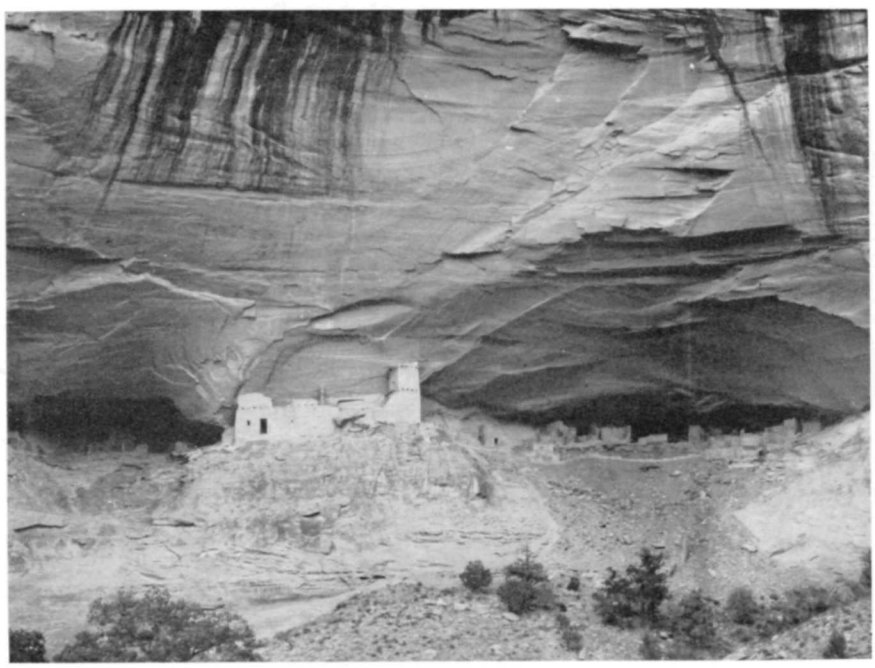
In the Canyon de Chelly country of northeastern Arizona, geological history is quite well known; but much remains to be learned about the human history of its canyons, gashed deeply into the colorful red sandstone of the Defiance Plateau. Canyon de Chelly National Monument was established in 1931 primarily because of the archeological and historical significance of its canyons; but it boasts also a rugged scenic beauty which remains fresh in visitors' memories.

The western boundary of the monument is located in the colorful Chinle formation, and the scenery of the vicinity is quite similar to that of Arizona's better-known Petrified Forest and Painted Desert countries. From this semi-arid desert setting the plateau in which the de Chelly canyons were cut extends east, rising with the bulge of the so-called Defiance Uplift.

During the more remote geological past the Canyon de Chelly area was a vast sandy plain near sea-level in elevation. At times the plain was covered by an arm of the sea, waters of which periodically receded; during such recessions large quantities of sand were blown in from an arid region farther north. The sand was deposited over the de Chelly country in the form of dunes and, with the passing of geologic time, was consolidated into sandstone. It was in the wind-formed de Chelly sandstone that the canyons of our present monument were later carved. When the arm of the ancient sea had retreated for the last time, the region was once more open to the attack of running water, and was finally laced with valleys and arroyos. Eventually it was covered again by a large, shifting body of water from the south, which filled depressions in the land's surface with a coarse gravel sediment.

Within de Chelly's Canyon del Muerto, upper portion of which is shown in the picture at right, are several prehistoric dwelling ruins. Outstanding among these are Antelope House, Mummy Cave and Standing Cow.





Perhaps the best-known ancient dwelling remains in Canyon de Chelly Monument are those of White House in Canyon de Chelly, above; but the Mummy Cave Ruin in Canyon del Muerto, below, records a much longer prehistoric occupation, thought by archeologists to span perhaps a thousand years.

This sediment is seen today as the geologist's Shinarump conglomerate, which forms a dark red cap-rock along the canyon rim. Other rock formations deposited above the de Chelly sandstone in later time were the Chinle, Wingate, Kayenta and Navajo sandstones, in that order.

Then came the uplifting of the present Defiance Plateau, and with the uplift the revival of old streams, which commenced cutting their channels down through the rather soft sandstone. As lifting gradually ceased, downcutting by the streams reached its maximum depths in the lower elevations of the monument. The cutting process, which still goes on actively in the higher elevations of the uplift, began depositing transported material at the lower ends of the canyons and aggradation, or filling, began. But filling is a slow process, and the de Chelly and companion canyons probably look about the same today as when the first human eyes viewed them.

It is not known when man first saw Canyon de Chelly, but it is at least certain that when he did, he was a nomadic, hunting individual, living on the game he could kill with crude weapons and the herbs, fruits and nuts he could gather to supplement a diet of meat. Perhaps his arrival represented a search for new hunting grounds. In any case, the nomadic groups eventually became sedentary, to till the fertile soil of canyon-bottoms and to develop homes in the shelter of cliff-side caves.

Sites in Canyon de Chelly and Canyon del Muerto indicate a continuous occupation for almost a thousand years, and Mummy Cave, in Canyon del Muerto, has been termed by some archeologists as perhaps the oldest consecutively occupied spot in the United States.

Since man's appearance on earth, changes in climate have affected his history profoundly. Tree-ring studies have recorded a great drought which began in the American Southwest around A. D. 1276 and continued until 1299. To a culture depending almost wholly on agriculture, the drought was disaster, and it led to a gradual migration toward lands with larger streams or dependable springs from which water could be carried to crop-

lands by hand or by ditch. By the beginning of the 14th century even the hardiest of those who had stayed had departed the canyons of de Chelly to make their homes elsewhere.

Excavation of the Tse Ta-Ah, a small ruin in Canyon de Chelly, has shown that there may have been later, seasonal occupation of the area. According to Hopi mythology a small group from Puyupki, in the Hopi country, farmed the canyons of de Chelly for several generations before returning to the Hopi villages permanently.

Peach Trees Introduced

The Hopi Indians say that after the Pueblo Indian rebellion against the Spanish, in 1680, an Indian group sought refuge from punitive measures in Canyon de Chelly, and that it was this group that first brought peach trees into the canyon—a plant introduced into the United States by Spanish padres. According to the Hopis, the Navajos had not at the time moved so far west; but after the reconquest of New Mexico and the establishment of garrisons of Spanish troops in the Rio Grande Valley, the Navajos were forced farther west.

For the Navajos, the canyons of de Chelly furnished an almost unassailable stronghold from which to continue their raids against the peaceful Pueblo Indians and the Spanish settlements. These raids were thorns in the sides of the Spanish, and later, Mexican, governments. By the beginning of the 19th century they had become such a nuisance that several military expeditions had been organized against them. One such punitive expedition, led by Antonio de Narbona, found and massacred some 115 Navajo men, women and children at a site in Canyon del Muerto later named "Massacre Cave."

But the punitive expeditions accomplished little other than encouragement of the Navajos to further raids; these continued unabated even after the territory was acquired by the United States. One of the first obligations assumed by the Americans, after capture of Santa Fe by Stephen W. Kearny, was protection of the inhabitants of the region from Navajo raids.

The first recorded entry of American troops into Canyon de Chelly was that of a detachment of Col. Doniphan's Missouri volunteers under Maj. W. H. T. Walker, who entered the canyon mouth and penetrated about six miles up the canyon before the danger of proceeding further was recognized. Maj. Walker withdrew his troops and returned to Santa Fe.

The next entry of American troops was the expedition led by Brevet Lt. Col. John Washington in late summer of 1849, when the first ratified treaty with the Navajos was concluded at a site near the mouth of the canyon. Later, in 1851, Col. Edwin Sumner passed by Canyon de Chelly in a somewhat ineffectual show of military force.

With the establishment of Fort Defiance in the heart of the Navajo country the raids diminished; but with the outbreak of the Civil War and subsequent withdrawal of troops the Fort was abandoned. By the fall of 1862 the U.S. Army's preoccupation with the Civil War had led both Navajos and Apaches to increase their raids on Spanish-American settlements.

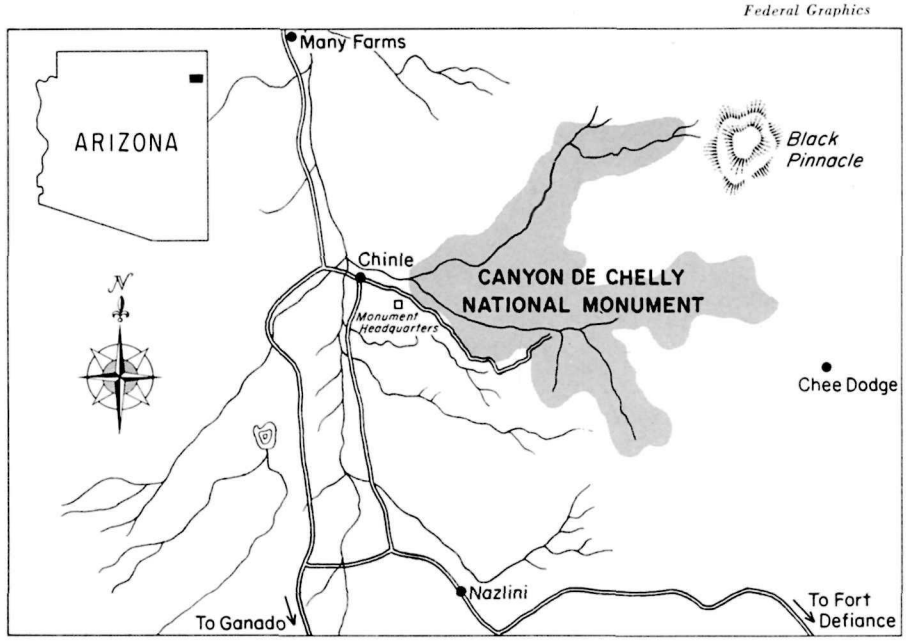
In June, 1863, Gen. J. H. Carleton, military governor of New Mexico, ordered Col. Christopher "Kit" Carson to proceed against the Navajos. Carson, with almost a thousand soldiers, including Ute and Zuni scouts, commenced his campaign against the Navajos, using the strategy of submission through starvation. He systematically laid waste cornfields and other crops, killed or captured Navajo livestock, and destroyed everything capable of sustaining human life. Then, in a military operation at Canyon de Chelly, some 14 Navajos were killed and about 105 captives taken; many others surrendered voluntarily. Eventually, 7000 Navajos were rounded up and taken to a reservation near Fort Sumner, New Mexico.

In 1868 the Government concluded a treaty with the Navajos, and they returned to a reservation set aside in their former lands—a vast tract of land which included their beloved Canyon de Chelly.

The years following their return were hard ones for the Navajos, for their orchards in the canyons, as well as their homes, had mostly been destroyed. But it was not long before orchards were replanted, fields cultivated; again canyon walls echoed to the chants of singing men and the happy laughter of women and children.

Today in Canyon de Chelly National Monument the visitor may see a blending of the old and the new as a fine people who never lost their tribal dignity strive to retain their heritage and at the same time bridge the gap between two cultures. At the monument visitor center one may be greeted by a Navajo National Park Service ranger or archeologist whose grandfathers fought the Utes and Mexicans; or one may see, in the canyons, Navajo families living as of old in their picturesque hogans. ■

Federal Graphics



The New Ozark Scenic Riverways

A wealth of natural and human history supplements the quiet charm of two southern Missouri rivers

In August, 1964, conservation in America won an impressive victory when Congress authorized the Ozark National Scenic Riverways in south-central Missouri in an act that virtually assures the preservation of 140 miles of the clear, swift-flowing Current and Jacks Forks Rivers and their verdant, bluff banks. These two free-flowing streams are the first in America to be specifically preserved within the national park system for their own intrinsic values.

The Riverways, established in a portion of the Ozarks still relatively wild and natural, houses a unique complex of springs and rivers, caves and sinks, plants and animals, and a folk culture characteristic of early American society.

The Ozark Riverways tells a complex and fascinating story of interrelated phenomena. The beautiful landscape of rolling hills, streams, and forests has evolved as a product of earth forces through countless ages.

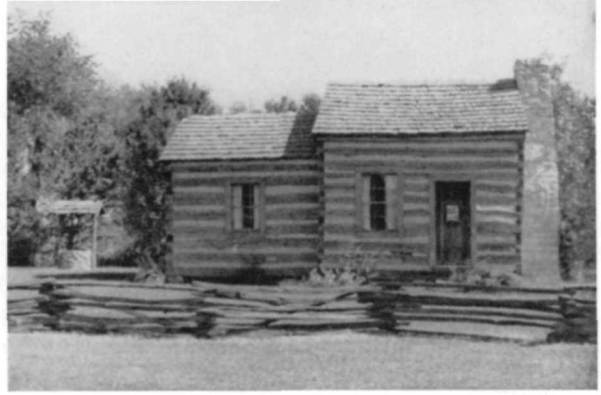
Millions of years ago, much of Missouri was covered by shallow inland seas. On the bottom of these water bodies sediments were deposited, which later became sandstone, shale, and limestone. Later, the gradual uplifting of the earth's surface drained the seas, exposing the nearly flat-lying strata to erosion and weathering processes.

One such process, solution, had much to do with forming the Ozark Riverways region. Carbon dioxide combined with rainwater to form carbonic

Some people will shed the tensions of modern living in john-boats on the Current River.

Photograph courtesy Missouri Commerce: Massie

By Eugene J. Wilhelm, Jr.



The log cabin is part of the Ozark Riverways scene.

Photograph by the author

acid. For thousands of years, groundwater containing this acid seeped through the surface mantle of soil and reached the limestone strata below. Working upon narrow cracks, joints, and fractures, the slow solvent action of the groundwater gradually dissolved the rock. Long-continued solution by this slow process ultimately produced large caverns, fissures and channelways. Underground streams, flowing through the dissolved passageways, enlarged them by scouring action. The process also cut passages vertically, so that pits and domes resulted.

The surface expression of the geological events affecting this vast honeycombed system of underground caves and caverns is a large number of potholes and sinks which dot the higher grounds between the major stream valleys, giving them something of a pockmarked character. This type of terrain is called *karst* topography, from its classic expression in the Karst region of Yugoslavia. Nearly every characteristic of karst topography described in geology textbooks, from fenster (window) to doline (sink) is found within the region of the Ozark Riverways. With the exception of Mammoth Cave National Park, karst topography of this type was lacking in areas of the National Park System.

Country of Many Springs

In many regions of karst topography, ground water collects, circulates through the natural underground conduits in the bedrock, and emerges at the earth's surface as springs of tremendous flow; and the Ozark Riverways region is noted for its many large and beautiful springs, some of which rank among the largest in the United States. The clear, cold, sparkling water issues from rocks, gravel beds, fissures, or caves in never-ending streams. Many springs originate in wooded valleys at the base of high, rocky cliffs, where they are surrounded by rugged and picturesque landscapes.

Such a charming situation exists at Big Springs, located in Big Spring State Park, four miles southeast of Van Buren. Largest spring in the Ozark region of Missouri and Arkansas, the water gushes with considerable force from the base of a towering cliff. The rushing surge of water leaps to the surface, then flows swiftly into the Current River several hundred feet downstream. By virtue of its nozzle effect, the water churns the surface of the spring pool at its main outlet and creates the "boil" that characterizes several of the larger springs of the Ozarks. The "boiling" water is a dramatic sight as it bursts free from the confinement of its underground channel. For countless decades Big Spring has flowed at the rate of 252 million gallons per day on average. A maximum flow was recorded in June, 1928, when 840 million gallons of water poured forth in one twenty-four hour period. Officially, this makes Big Spring the largest single-outlet spring in the United States.

Of eleven springs in the Missouri Ozarks having an average flow of 65 million gallons or more a day, four are in the Current-Jacks Fork country—Big Spring, Welch Spring, and Blue Spring on the Current, and Alley Spring on the Jacks Fork. In addition to Big Spring State Park, two other state parks adjoin, but are excluded from, the riverways area of 65,000 acres—Round Spring, north of Eminence, and Alley Spring, with its old red grist mill, west of the same town. The National Park Service would like to add these parks to the riverways territory, but the addition would need approval of the Missouri legislature.

Vegetation to Ozark Riverways is what rocky seashores are to Acadia National Park, geysers to Yellowstone, and canyon walls to Zion. There being no timberline in the Ozarks, plants are practically everywhere. In fact, even the forest clearings made by white men in the nineteenth and twentieth centuries are rapidly reverting to trees. Today, about three-fourths of the land is covered with forest, mostly hardwoods like oaks and hickories.

Soils and Plant Life

Situated south of the region of North America affected by continental glaciation, Ozark soils largely represent the disintegrated material of the bedrock upon which they have formed. The widespread limestones of the Ozarks have produced soils suitable for hardwood forests and bountiful wildlife. The soils vary widely in moisture, temperature, depth, porosity, and exposure. The many combinations of environmental factors have produced a remarkably interesting assemblage of plant life in a relatively limited region.

Despite these complex relationships, phytogeographers have recognized four general forest types: mixed mesophytic, western mesophytic, oak-hickory and oak-pine forests. The oak-hickory type dominates the uplands of the Ozark plateau. However, within these forest classifications there is considerable variation in the expression of flora because of site factors.

For example, the wet bluffs along the river courses that face to the north usually provide suitable habitat for a quite distinctive group of plants dominated by ferns, with a dense vegetation of shrubs and shade-tolerant herbs along the basal slopes and the shaded flats between the cliffs and rivers.

Here occur some of the unusual or rare plants that most distinguish the flora of the region. Maidenhair fern forms dripping green draperies under almost every overhanging bluff. Spleenwort, bladder fern, walking fern, wood fern, and sword fern exist side by side in such moist sites. Other attractive flowering herbs include Jack-in-the-pulpit, Solomon's seal, trilliums, orchids, wild ginger, columbine, bloodroot, Dutchman's breeches, and many others.

The drier limestone bluffs present some interesting wildflower displays featuring tall larkspur, endemic to the Ozark region; the large-flowered evening primrose, locally known as "glade lily"; purple-flowered coneflower; yellow coneflower; blue wild indigo; and black-eyed Susan. Still different assortments of plants occur in the "shut-ins," sink ponds, marshes, and river floodplains.

A Variety of Trees

In addition to the many oaks and hickories, other trees of the forest are maple, shortleaf pine, tulip, black tupelo, sweet gum, and birch. A few trees are notable for their flowers or fruit, like the hawthorn, dogwood, redbud, and witch hazel.

In all, 1,500 different kinds of plants are reportedly found here. Such great variety is based on several factors, one of the most important being the long period of time that the Ozarks have stood free as land masses. Likewise, continental glaciation farther north brought climatic changes which induced northern plants to migrate south. With the retreat of the ice sheet, southern plants moved northward. Maidenbush, water oak, and chittamwood represent only a few "southerners" which have invaded the territory. Due to the area's central continental location, plants have arrived here from all directions. Thus, cool bluffs contain plants characteristic of the Appalachians; marshes and sink-ponds possess plants similar to those of the South; and dry sites contain plants with a southwestern affinity. The combination of all these make the region an outstanding area botanically.

There is a great variety of wildlife in the Ozark Riverways region. Before the white man appeared in the Ozarks, luxuriant forests provided food and cover for the mountain lion, black bear, timber wolf, red wolf, otter, and fisher.

With the coming of the white man's rifle, ax, plow, and fire, the land of plentiful game temporarily disappeared. The wild turkey and ruffed grouse, heavily hunted game birds, were particularly depleted. Even forest birds like the woodpeckers began to decrease.

But since the 1930's the forest has crept back, fire scars have healed, and many plants and animals have returned to their former abodes. Grass fires and forest fires are controlled. Under these circumstances deer, bobcat, beaver, and wild turkey are once again observed along the trails and roads of the Ozark hills.

Photograph by the author

Big Spring, the largest single-outlet spring in the United States, has a maximum flow of 840 million gallons of water per day.

Probably more than 200 kinds of birds are known to the Ozark Riverways region. From low gaps to high hills the birdlife in summer is abundant and varied. Along the Current and Jacks Fork Rivers the more common birds include the noisy kingfisher and two waders, the little green and the great blue herons. Two species of shorebirds breed on the gravel bars, the spotted sandpiper and the killdeer; the latter species is nature's official "watchdog," alerting wild creatures of approaching danger. The beautiful wood duck nests along the riverways, while large soaring birds like vultures and hawks float conspicuously over ridges and valleys.

Enough mature forest habitat remains to support a normal population of pileated woodpeckers. These crow-sized, scarlet-crested birds are indeed a spectacle as they fly through the openings of the woodlands or across a river. Their loud, chortled calls are heard frequently as one floats down the Current or Jacks Fork.

Forests, fields, and riverways provide a variety of habitat for songbirds. From the underbrush along the rivers the towhee calls. In the forest, at least six kinds of birds have a robin-like song; but by far the most colorful in plumage are the scarlet tanager and the rose-breasted grosbeak.

The forests provide a home for many mammals. White-tailed deer, gray, fox, and flying squirrels, raccoon, opossum, and skunk are quite

Beaver have returned to the Ozark riverways.

Photograph by the author

plentiful. Less common are the red and the gray fox, bobcat, mink, muskrat, and cottontail rabbit. Badgers are occasionally reported, while the red wolf, native to this part of America, still persists in small numbers. Apparently the red wolf cannot tolerate increasing human habitation and the changes man makes on the land, for only four red wolves have been authoritatively identified here in the past thirty years. This species of wolf is represented nowhere else in the national park system. The black bear probably has re-entered the riverways country from the rugged mountains of Arkansas, and under protection may in due time be re-established in small numbers.

The Ozark Riverways has a long history of human occupation. With bountiful supplies of fresh water, food, and shelter, the region was an irresistible attraction for prehistoric hunters, fishers, and gatherers. Limited archeological investigations have uncovered abundant artifacts, some of which indicate that man has been in the region for more than 10,000 years.

Settlement of the Ozarks

The modern history of the region is similar to that of the Ozark country as a whole. This section of Missouri was settled initially by people from the mountain regions of Kentucky, Tennessee, and States farther east in the early nineteenth century. The settlers were nearly all of Scotch-Irish, English, and German stock; most of them were seeking mineral wealth. But even after the main stream of westward migration had passed the Ozarks, the pine forest of the region remained mainly untouched. After the Civil War, however, eastern timber barons bought the pine lands and the Ozarks became a scene of bustling timber activity.

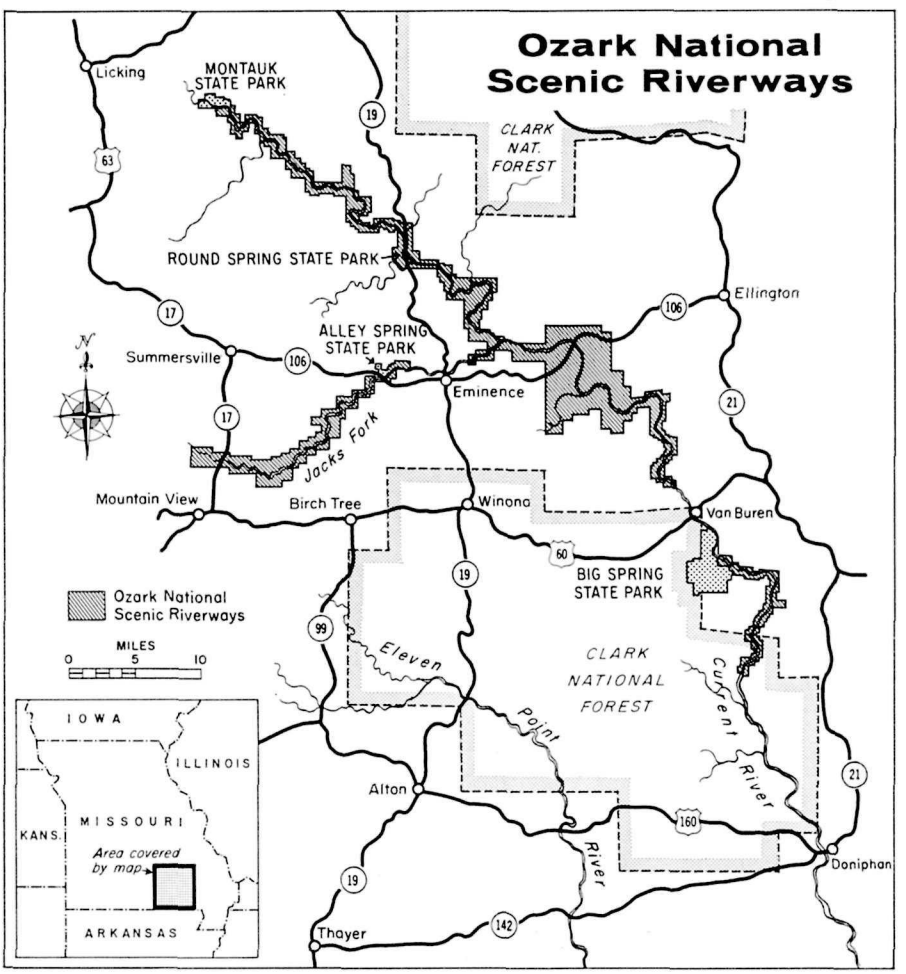
Through all these human events the rivers themselves remained somewhat off the beaten path. River-use then, as now, was still relatively light, and largely by local people. However, the local river travellers did develop a unique boat—the john-boat—which is still used today. It was adapted to local transportation, floating, and float-fishing. Like the pirogue of the Cajun and the birch-bark canoe of the Chippewa, it showed the grace and beauty that can be achieved when, with skill and imagination, native materials are handicrafted into useful objects. Alternating rapids or chutes and quiet waters were ideal "habitat" for this long boat, with its square, upturned ends and flat bottom.

The Current and Jacks Fork Rivers are famous throughout the nation as float-fishing streams. Further, they represent some of the best smallmouth bass streams left in Missouri. Fishermen embark in john-boats, usually with a local guide to handle the boat in the swift water; some camp on the convenient gravel bars. Others go along merely for the scenic beauty of a ride down the swift rivers. Ninety-three species of fishes have been reported from these rivers, including the rock, smallmouth and largemouth bass, walleyed pike, and chain pickerel.

The Current is the larger of the two rivers. Rising in Montauk State Park in southern Dent County, it flows 140 miles southeasterly through four counties to the Arkansas border. Born of Montauk Springs, it is fed by other giant springs along the way. Its major tributary, the Jacks Fork, rises in southeast Texas County and flows easterly for about forty-five miles before joining the Current. Along the Jacks Fork is perhaps the finest scenery of the entire district, with a special wild yet intimate quality.

Streams like the Current and Jacks Fork represent a continually shrinking national resource; few rivers remain unspoiled, unpolluted, unexploited, or undammed in expanding, booming, prosperous America. The Ozark National Scenic Riverways retains an unusual feeling of naturalness; in places, a quality of wilderness. Though it represents a resource that is rapidly being lost and increasingly needed, it also represents a wonderful heritage for future Americans, and may pioneer the preservation of other representative free-flowing, clean American streams. ■

Federal Graphics



Under consideration for national monument status are

The Fossil Beds of Florissant

By Eleanor E. Gamer

Photograph by Carlton Gamer

Above, a view of the terrain in which, nearly a hundred years ago, Dr. A. C. Peale of the Hayden Survey discovered the world-renowned fossil beds of Florissant.

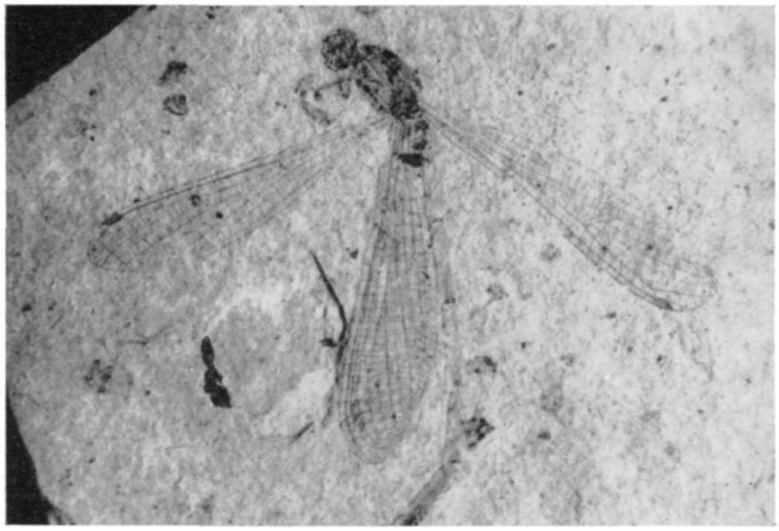
JUST UNDER A CENTURY AGO, IN 1867, a group of intrepid gentleman-scholars began a detailed exploration of our West. Led by Ferdinand V. Hayden, the group observed, mapped, and collected for twelve years. Its findings are incorporated in the fifty volumes comprising the *United States Geological and Geographical Survey of the Territories*, affectionately known as the "Hayden Survey." Dr. A. C. Peale, a member of the Hayden team, was the first to discover the fossil lake beds of Florissant, Colorado. Within a few years the paleontological specialists of the Hayden Survey were hard at work: E. D. Cope on fishes, Leo Lesquereux on plants, and S. H. Scudder on insects.

Word of the find spread gradually throughout museums and universities, and by 1912 thousands of Florissant fossils could be seen in major paleontological collections around the world. It has been estimated that of 150 localities containing fossil insects, only the Baltic amber has yielded a greater number of specimens than have the little lake beds of Florissant. Among these sixty thousand fossils, which represent over a thousand species, is to be found an enormous panorama of insect life including four species of the *tse-tse* fly, and virtually all of the New World butterflies.

The singularity of the Florissant lake beds that led to this intensive collecting is perhaps more understandable when one considers that preservation of land biota as fossils is of rare occurrence. Such preservation requires unusual conditions or events to ensure burial and compaction before decay of the living material can take place. This is especially true for delicate objects such as leaves and insects. The story of Florissant's origin is the key to its importance.

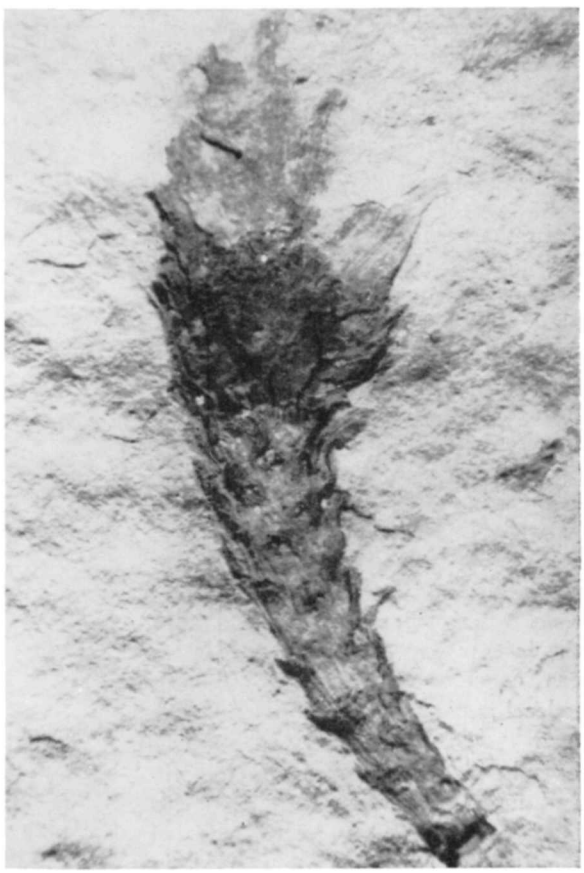
Florissant is only a tiny pocket, twenty-four square miles in area, lying at 8,200 feet altitude within the great arch of the Rocky Mountains. Its geologic history begins with the Laramide orogeny of Late Cretaceous time. Uplift and volcanism were balanced, for a time, by the forces of erosion; intermontane basins were filled with sediments to the tops of worn and dissected mountains. The small basin holding the lakes may have had its beginnings in the Late Eocene as a series of valleys cut into the basal granite of the mountain tops, by streams which cleared the area of sediments, and shaped a topography of low relief. The normal direction of flow for these streams would have been toward the southwest, but with the rise of the Pike's Peak massif to the south the valleys were tilted towards the northwest, the drainage pattern was disrupted, and the streams became ponded. Extreme volcanism accompanied the uplift; the sediments of the lake beds are predominantly of volcanic ash with lava fragments and pumice alternating with layers of compacted mud washed from the shores of the lakes. Frequent forest fires, probably initiated by hot volcanic debris, are recorded by carbonized wood fragments present in the beds.

The remnants of three fossil forests are to be found, one upon the other. One had been toppled, perhaps by a volcanic blast, but the topmost forest



The remains of many species of Oligocene plants and animals are found in a remarkable state of preservation at Florissant. At top, left, an insect of the order Odonata, x2; top, right, leaf of *Fagopsis longifolia*, dominant streamside tree in Oligocene Florissant. At left, an insect of the order Coleoptera, x3. Below, left: flower of *Phenanthera petalifera*, a plant of uncertain taxonomic position, x5; right, terminal branchlet with cone, unknown species of conifer, x3.

The Florissant specimens shown on this page are in the collection of Colorado College, and were photographed by Dr. John H. Lewis, of the College's Department of Geology.



closest living relative grows only in restricted areas on the Pacific coast.

Botany of Ancient Florissant

The understory trees and shrubs of the lowland group are notable in that they include a number of species that are characteristic of streamside habitat in the subhumid scrub forest of southwestern Texas and northern Mexico today. On the valley slopes, extending onto the high-ground habitat, were species whose living analogues are found among the shrubby flora making up the chaparral associations extending from the prairies of eastern Nebraska west and south into Texas, and in northern to central Mexico, as part of an arid, or semiarid, scrub.

On high ground might be found pines and dwarf evergreen oaks along with hardier members of the chaparral group. There is little evidence of extensive grassland, fossil remains being restricted to *Stipa*, a grass of semiarid land which probably grew in open areas between the oaks and pines.

True upland plants are rare in the fossil flora, as might be expected considering their distance from the lake beds. Firs and maples may be presumed to have inhabited the cool slopes of nearby highlands. Needles found at all localities imply at least a moderate abundance of pine on the higher elevations surrounding the basin. There are species ancestral to yellow and white pine, and the piñon.

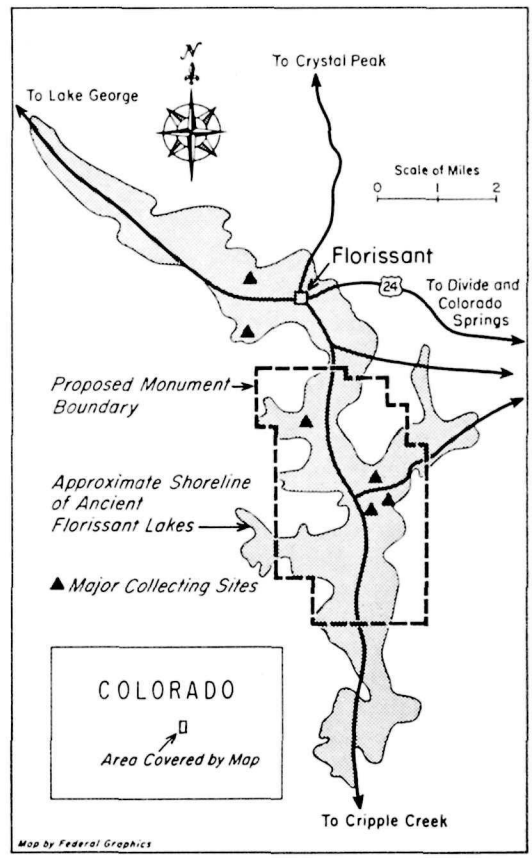
Study of a complete list of fossil species, and comparison with an enumeration of identical, or closely related, modern species and their habitats, leads to the conclusion that, as a whole, the assemblage is indicative of a warm-temperate, subhumid climate. Of 91 species listed as having close living relations, 69 of the living analogues are to be found in the southern Rocky Mountains from southern Colorado to Chihuahua, and from the Edwards Plateau of central Texas south to San Luis Potosí. Eleven more species are found between southern Arizona and Sinaloa. Relationships with modern southern and eastern groups can be seen in the twenty-five species to be found extending from the Ozark Plateau to the southern Appalachians.

Tropical, or subtropical, elements do occur: nine counterparts of fossil species appear in southern Mexico today and two in South America; but this group of plants is to be found in many of the Tertiary floras of the western states, and its presence in Florissant proves little more than adaptation of these species to more temperate climates, and that north-south migration has been a significant factor in the New World for a very long time.

Among the insects, too, the same problem is found; some of the most numerous genera have tropical associations, while others have distinctly temperate ones. These insects are very useful as climatic indicators, as they have shown virtually no evolutionary development since the Middle Tertiary. The three fossil forests, however, may provide a clue to changes which occurred in Florissant. Their position indicates that, prior to the deposition of the lake shales, the climate was truly moist and warm, and that gradually, during the deposition of the shales, it became more arid and temperate. Most obvious is the change in composition of the bottomland forest from *Sequoia* and cypress to the pines and spruce of today, clearly indicating the onset of a more north-temperate climate and increased elevation of the basin. Thirty-five million years ago Florissant was undoubtedly similar to northeastern Mexico or northern Argentina between 20° and 30° latitude.

Although much material has already been recovered from the Florissant lake beds, only six small sites have been methodically worked, and much is yet to be done. There is an untold wealth of material still buried beneath the quiet grazing lands and forests of the basin. At present the northwest arm of the lakes has been seriously altered by road construction, and developments in housing and the tourist trade. Uncontrolled fossil quarrying and vandalism have destroyed much valuable surface material. The south arm of the lakes, however, consists of eleven privately owned ranches. Two of these have attempted to capitalize on their position by developing fossil quarries as tourist attractions, but on the whole, the lake bed remains undisturbed.

But Florissant lies an easy driving distance from several major Colorado cities, and is rapidly becoming a prime site for summer recreation because of its delightful climate and mountain scenery. Logging, and land development for vacation cabin sites, will soon wholly destroy one of the world's great fossil localities. The opportunity for preservation, further controlled collection, and more research, will be lost.



In 1962 the National Park Service put forward a proposal to acquire a portion of the south arm of the lakes for a national monument. Undeniably such protection is immediately necessary if any part of the fossil beds are to be preserved for research and interpretation to the public. Inclusion of a Florissant Fossil Beds National Monument in the national parks system is deemed by many, both in and out of the scientific world, as important to round out the nation's holdings of fossil remains. It would make a perfect companion area to Petrified Forest National Park of Arizona, with its magnificent silicified tree trunks, and to Dinosaur National Monument in Utah and Colorado, with its huge vertebrate fossils. Only Florissant can provide the fine miniatures of the Tertiary which connect the larger remnants of the Mesozoic with the world of today. ■

The Editorial Page

(*Continued from page 2*)

recommend the necessary appropriations in his customary budget messages.

A model program for the Potomac will mean, in the second place, vigorous use of machinery already in existence in the Department of Agriculture under the Watershed Protection and Flood Prevention Act (Small Watersheds Act) for the development of a network of small headwater impoundments for flood control, local water supply, and high-quality outdoor recreation. The headwater impoundment system is superior to the big-reservoir system in every respect and should supplant the big reservoirs, not merely supplement such reservoirs. Present planning in the Department of the Interior contemplates the use of headwater impoundments only as a supplement to the big reservoirs; this was the idea in the original Army Engineers' Program, and would be unacceptable as part of a model program for the Basin. Here again, because of the President's great interest in these problems, he will presumably recommend adequate appropriations; lack of appropriations has been the main problem in the past.

A model program will see to it that provision is made for abundant local water-main supplies throughout the Basin. In addition to the Small Watersheds Act, there is plenty of other statutory authority, exercised by a number of Federal agencies, for both local storage and pollution abatement facilities guaranteeing provision for such supplies throughout the Basin. For the Washington Metropolitan Area an intake can be constructed in the freshwater estuary of the Potomac; many new methods exist whereby plant nutrients (which cause algae blooms) can be eliminated without great cost from treatment-plant effluents; it is now widely recognized that storage for dilution and flushing will not eliminate such contaminants from estuaries. Coordination of these water supply programs could be assigned by Executive Order to the new interdepartmental Water Resources Council, established by the new Water Resources Planning Act of 1965, which has passed both Houses of Congress and will presumably soon be law.

The major reservoirs the Army Engineers are promoting are mass-eviction reservoirs; that is, they will require the wholesale evacuation of human beings from their homes, farms, businesses, and communities by the use of the Federal power of eminent domain; they are also deep-drawdown reservoirs, with wide margins between vegetation and water most of the year, hideous defacement of shorelines, and a wanton destruction of natural beauty and the natural outdoor environment.

Present thinking in the Department of the Interior is to pass these structures off as "mountain lakes," on the pretext that water levels will not be drawn down unless needed for urban water supply downstream; they cannot be justified on a normal benefit-cost ratio without such drawdowns; hence, the pretense of stable water levels is patently specious. Human beings should not be evicted from their homes and communities under such false pretenses.

It should be made clear that if a determined attack is made on pollution throughout the Basin, by preventing pollution from entering the river, and not by diluting or flushing it afterward, the natural flow of the river, its tributaries, and headwaters, can be recycled and used over and over again on the way to the sea, and water-main supplies for the smaller communities and the Metropolitan Area can be multiplied indefinitely; this system of water-main supply, and only this system, can provide for the water-supply needs of the people of the Potomac Basin throughout the foreseeable future; storage in big reservoirs will not do the job; that idea should be abandoned, and we should get going with solutions based on modern technology.

It seems clear that a broad public consensus has long since been established for the protection of the old C & O Canal as a national historical park. The scenic beauty and recreational opportunities around the estuary and along both banks of the main river can be protected by scenic easements which safeguard all proper interests of the owners of the land; spacious outdoor recreation facilities can thus be provided in perpetuity for the people of the great city.

Yet the planners in the Department of the Interior seem still to be hesitating about the Seneca dam; plans are being unfurled for a so-called scenic parkway along the Virginia shore between Washington and Harpers Ferry, the only result of which can be a reciprocal demand for a scenic parkway on the Maryland side; such a parkway must of necessity come down at least partly on C & O Canal lands, thus bringing the defenders of the Canal back to the place they started in opposing a scenic parkway along the Canal as long ago as 1953; it was that proposal that gave birth to the famous hike led by Justice William O. Douglas from Cumberland to Washington in 1954 and the founding of the C & O Canal Association. What folly and weakness can lead to the resurrection of such projects at this late date?

A VERY BROAD CONSENSUS already exists for a genuine model program of the kind the defenders of the Potomac have recommended. The necessary laws and the administrative machinery are already for the most part available. The Secretary owes it to the President, in our judgment, to present him with a program which uses this machinery, which fully exploits all the modern alternatives and technological innovations, and which can have the support of this powerful consensus which already exists. We think he also owes it to the people of the Potomac Basin and the nation to complete his recommendations promptly, and to avoid further embroilment in partial or complete revivals of the discredited Army Engineers' Program. —*A.W.S.*

News and Commentary

NPA's Annual Meeting

The annual meeting of the National Parks Association's board of trustees took place at Association headquarters in Washington on May 20th. Preceding the session of the full board, the organization's executive committee met briefly; and the balance of the day was devoted to consideration of officer and trustee nominations, Association affairs and activities, and current national park and general conservation problems and events.

Elected to fill vacancies on the board of trustees were Dr. Richard C. Bradley, professor of physics at Colorado College; Dr. Edward H. Graham of Vienna, Virginia, formerly of the U. S. Forest Service and currently a vice-president of the International Union for the Conservation of Nature and Natural Resources; Professor Harry G. M. Jopson of the Department of Biology at Bridgewater College; and Professor Harry Robert Page, assistant to the chairman of the Department of Business Administration and Public Affairs at George Washington University. To fill a vacancy on the executive committee, the trustees elected Michael Straight, editor and author, of Alexandria, Virginia.

Following the day's formal session many of the trustees, staff and invited guests attended an outdoor dinner at Stronghold, preserved estate of the late Gordon Strong, not far from Frederick, Maryland. The grounds and buildings of the beautiful estate were opened to the Association and its guests by courtesy of the non-profit organization, Stronghold, Inc., which has extended similar courtesy in past years.

Water Valley Dam Unlikely

We recently read a brief release from the Army Department—five short paragraphs, actually—which has special significance for conservationists generally and for the folk of the upper Eleven Point River country of Arkansas and Missouri in particular. The release dealt with the proposed Water Valley dam and reservoir which the Army Engineers has for 24 years been planning for the Eleven Point at Water Valley in northern Arkansas near the town of Pocahontas. The Army Board for Rivers and Harbors has had the project under review during the past few months, and last sentence, last paragraph of the release says, "The Board recommends deauthorization."

The curt words veil a long story of strong conservationist and lay opposition to a generally unwanted and highly destructive dam project for which plans seemed to have been proceeding with a certain glacial inevitability. First authorized in 1938 as a flood-control project and later investigated for a rather small hydropower potential, the Water Valley dam and reservoir idea never received other than minor public support in the beautiful valleys of the upper Eleven Point. Conservationist and other opposition, spearheaded by the Upper Eleven Point River Association, finally came to a climax in a memorable Corps of Engineers public hearing at Walnut Ridge, Arkansas, in early 1964. This hearing, and the effective film and publications of the Upper Eleven Point River Association and other similar associations, was very likely instrumental in encouraging production of the deauthorizing recommendation quoted above.

Deauthorization of the Water Valley dam would represent an important victory for the conservators of the nation's natural resources and beauty; conservationists would do well, however, to bear in mind that, like desert plants, high-dam proposals are able to exist for a long time without water.

University Research Program

America's new generation—fast growing and better educated—has inherited a mounting crisis stemming from unwise natural resource use in the past. To help young Americans correct the man-made imbalance in nature's ecological cycle, conservationists must increasingly concern themselves with education for enlightened resource management and use. The National Parks Association, in keeping with its function as a scientific and educational institution, has recently developed a new program of conservation education to guide interested young men and women toward careers devoted to protection and restoration of the natural environment.

The University Research Program, directed from the Association's headquarters in Washington, invites qualified *graduate men and women enrolled in any* Washington, D.C., area university to link their special fields of study with various phases of conservation work, such as wildlife management, urban planning, ecology and related sciences, demography, law, political science, and other fields. Participating students will be

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given the opportunity to write their master's or doctoral theses on actual case studies, under the personal guidance of professional conservationists with specialized knowledge in the student's field of interest. In all cases academic requirements will be determined by the university, but the program will be flexible enough to tailor other requirements to the individual needs and wishes of the student. For such "outside work" students will receive full academic credit; in many cases funds are available for student travel in connection with their projects.

Further details may be obtained from Mrs. Maxine A. Rock, program director, at NPA headquarters. Inquiries should be made by telephoning Mrs. Rock at 296-6655; appointments may be made to discuss the program in person if the student so wishes.

John Taylor

Although farmers and conservationists share a common respect for the bounties of nature, they often find themselves disagreeing on management of land and water resources. In the recent past, however, individuals of both groups have formed a strong bond of mutual understanding and affection, partly through the actions of a man who one conservationist has called ". . . a truly great American . . . (who) had the power of his convictions based upon a lifetime working near the soil as a farmer and representative of important farm organizations." That man was John I. Taylor, respected member of the Washington staff of the American Farm Bureau Federation. Mr. Taylor died recently after an extended illness, and a long and impressive career devoted to wise use of natural resources was ended. His strength of character and professional leadership will be missed by both farmers and conservationists.

Briggs and Cain Switch Jobs

An exchange of offices and responsibilities in the Department of the Interior has recently been announced by Interior Secretary Stewart L. Udall: Frank P. Briggs, former Assistant Secretary of the Interior for Fish and Wildlife, has been appointed to the Advisory Board on National Parks, Historic Sites, Buildings and Monuments. Dr. Stanley A. Cain, who held the Advisory Board post, became the Assistant Secretary late this May; Mr. Briggs was then appointed to fill Dr. Cain's unexpired term on the Board. There are ten other distinguished members of the Advisory Board, who assist the Secretary in various phases of park problems.

The Conference on Natural Beauty

In an early February message to Congress on natural beauty President Johnson indicated that he would call a White House conference on natural beauty in May at which new ideas and approaches to enhancement of America's natural beauty might be presented and discussed. Thus, on May 24 and 25 a host of conservationists, businessmen, government officials and professional people from all over the country, and some from abroad, gathered in Washington on Presidential invitation to canvass, under leadership of the President and Mrs. Johnson and the able chairmanship of Laurance S. Rockefeller, the complex relationships between man's uses of the nation's land, water and air, and the physical and esthetic health of these resources.

All the fields with which conservationists are familiar—outdoor recreation, preservation, city planning, air and water pollution, wildlife conservation, highway construction, billboard control, and the rest—were examined by the 120 panelists of the conference and the thousand-odd persons in attendance, in a flow of words and ideas which would require many magazine pages to summarize. But the main thrust of the conference was, perhaps, toward inscription of the concept of natural beauty on existing and future Federal programs.

THE CONSERVATION DOCKET

To help save the American alligator, a species in danger of extinction, Rep. T. A. Thompson has introduced *H.R. 8038* to extend protection of the Lacey Act to reptiles and amphibians. The bill is in the House Committee on the Judiciary; an early hearing is expected.

S. 1071 has been introduced by Senator Clark to provide for humane treatment of experimental laboratory animals. The bill was referred to the Senate Committee on Labor and Public Welfare; no hearings are scheduled at this writing (June 7).

Establishment of an Indiana Dunes National Lakeshore took a forward step with a favorable report on *S. 360*, Senator Jackson and others, by the Subcommittee on Parks and Recreation of the Senate Committee on Interior and Insular Affairs. The bill now goes to full committee.

To protect the scenic, free-flowing and unpolluted St. Croix River on the Wisconsin-Minnesota State border, Senators Nelson and Mondale have introduced *S. 897* to create a St. Croix National Scenic Waterway. The bill, referred to the Senate Committee on Interior and Insular Affairs, was scheduled for hearings late in April; no further action has been taken.

S. 98, introduced by Senator Anderson and five other senators to authorize the Secretary of the Interior to study specified portions of the nation's shorelines for purchase and preservation of suitable recreational areas, remains in the Senate Committee on Interior and Insular Affairs. Under provisions of the bill, the Forest Service would be authorized to make a similar study of shoreline areas in the national forests.

To prevent pollution of streams by acid mine water leakage and siltation during and after strip-mining operations, and to determine the effect of such operations on fish, wildlife, and other natural resources, Rep. Saylor has introduced *H.R. 895*, authorizing a Department of the Interior study of strip-mining. Another of Mr. Saylor's bills, *H.R. 896*, would amend the Federal Water Pollution Control Act to provide for sealing of abandoned coal mines to prevent destructive acid drainage. *H.R. 895* is in the House Committee on Interior and Insular Affairs; *H.R. 896* went to the House Committee on Public Works.

H.R. 4001, amending the Clean Air Act to control harmful discharges from vehicles and set up a Federal Air Pollution Control Laboratory, has been introduced by Rep. Fallon and sent to the House Committee on Public Works; *S. 306*, a similar bill introduced by Senator Muskie and others, received hearings in the Special Subcommittee on Air and Water Pollution of the Senate Public Works Committee. At the hearings, the Assistant Secretary of Health, Education, and Welfare agreed with the bill's requirement for pollution control devices on automobiles by 1968.

S. 339, introduced by Senator Hruska, and *H.R. 500*, by Rep. Martin, to provide for establishment of an Agate Fossil Beds National Monument in Nebraska, passed Senate and House, and an enabling Act was signed by President Johnson on June 5 after a House and Senate agreement on an amendment. The Act is *Public Law 89-33*.

Identical bills to establish a Nez Perce National Historical Park in the State of Idaho have been introduced in the House as *H.R. 908*, Rep. White, and in the Senate as *S. 60*, by Senators Church and Jordan. Both bills were referred to the respective subcommittees on Parks and Recreation of the Interior and Insular Affairs Committee; *S. 60* has been reported out of Committee, and it passed the Senate by voice vote. *H.R. 908* was favorably reported to the House.

Rep. McDowell has introduced *H.R. 8320*, to expand, extend, and accelerate the Department of the Interior's saline water conversion program. The bill has been referred to the House Committee on Interior and Insular Affairs; no hearings have been scheduled.

Rep. Clausen has introduced H.R. 7061, calling for an increase in funds to acquire lands for Point Reyes National Seashore, and the bill is in the House Interior and Insular Affairs Committee.

A bill to promote research and generate discussion on the population problem was introduced by Rep. Todd. *H.R. 7072* authorizes the President to call a special conference on world population problems; it has been referred to the House Committee on Government Operations.

The Scenic Hudson Preservation Conference, seeking to prevent Consolidated Edison Company of New York from building a pumped-storage hydroelectric project at Storm King Mountain on the Hudson River, has recently applied to the Federal Power Commission for a rehearing on the March 9, 1965, F.P.C. order granting a license to Con. Ed. to go ahead with its project. The application was denied.

Review

NATIONAL PARKS: SUMMER JOBS. By Michael O'Hara Stevens and Gene Falk. O'Hara/Falk Research, Box 4495, Fresno, California. Hard cover, illustrated. 162 pages. Price unlisted.

Each spring, with the desperate determination of a flash flood, questions pour into the offices of Associations like NPA on how to get a summer job in the national parks. Inevitably, the query comes too late; the young job-seeker, devoid of factual information regarding park employment, is often disappointed. To help answer the flood of questions and resulting disappointments, the research team of O'Hara and Falk has recently published a factual, down-to-earth book on summer jobs in national parks.

The book relays vital information to the job seeker, and does it with excellent reporting, photographic illustrations, and refreshing clarity. Interested young men and women can find out what a summer job in the national parks is like, without what the authors call "the illusion of glamour or 'vacation with pay.'"

Some Adirondack History

Listed below is a series of books which our historically oriented readers with an interest in New York's Adirondacks may find valuable. The books are revised extracts from Harold K. Hochschild's award-winning *Township 34*, which back in 1952 was cited as "a remarkable local history."

Doctor Durant and His Iron Horse, 24 pp. 10 illustrations, 3 maps, 1961. $2.00

Adirondack Railroads, Real and Phantom, 34 pp., 9 illustrations, 10 maps, 1962. $2.25

An Adirondack Resort in the Nineteenth Century, Blue Mountain Lake 1870-1900, Stagecoaches and Luxury Hotels, 112 pp., 106 illustrations, 3 maps, 1962. $4.50

Life and Leisure in the Adirondack Backwoods. 132 pp., 127 illustrations, 6 maps, 1962. $4.75

Lumberjacks and Rivermen in the Central Adirondacks, 1850-1950. 100 pp., 83 illustrations, 4 maps, 1962. $4.00

The MacIntyre Mine—From Failure to Fortune. 40 pp., 11 illustrations, 2 maps, 1962. $2.50

Adirondack Steamboats on Raquette and Blue Mountain Lakes. 46 pp., 40 illustrations, 3 maps, 1962. $2.75

These publications may be obtained at the stated prices, postpaid, from: The Adirondack Museum, Blue Mountain Lake, New York.

A twig of Sequoia affinis, *a fossil* Sequoia *similar to the modern California coastal redwood, from the beds of the Florissant, Colorado, fossil locality. The specimen is in the collection of Colorado College; Dr. John H. Lewis of the College was the photographer.*

OF THE MANY BOOKS that record the history of the earth and its guests, the plants and animals, that volume which deals with geology—the changing face of the earth—contains the most pages. There are many pages missing, however, from this, the largest of the natural history books; some pages, also, are illegible up to the present, others obscure in their meanings. Our national park system contains a number of preservations that are outstanding for the bits of the geological past they reveal, and several other possible preservations, like the Florissant fossil beds of Colorado, have been suggested for addition to the park system and the furtherance of public knowledge.

AS THE COUNTRY'S leading conservation organization devoted primarily to the welfare of the national park system, the National Parks Association evaluates the nature and quality of proposed scientific preservations and keeps its members informed through timely articles. You can assist the Association in this work in any of several ways: by contribution to the general funds of the Association over and above regular dues; by renewing membership promptly; by remembering the Association in your will; or by helping to secure new Association members. All gifts and bequests are deductible for Federal income, gift and estate tax purposes.

National Parks Association

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