

NATIONAL PARKS *Magazine*



The Capitan fossil reef in Gray Cove tributary to South McKittrick Canyon,
proposed Guadalupe Mountains National Park, trans-Pecos Texas

September 1965

Water and Power For the Southwest

An Editorial

IN RECOMMENDING RECENTLY THAT AUTHORIZATION of the proposed Bridge Canyon dam on the Colorado River below Grand Canyon National Park and Monument be deferred for later consideration, the Bureau of the Budget concurred in the judgment of the National Parks Association, as repeatedly expressed earlier in these pages, and many other responsible students of the problem.

Bridge Canyon dam would flood a reservoir into both monument and park, destroying scenic resources of world-wide significance, and violating the established national policy of non-impairment of national parks by reservoirs. Not one drop of its storage would go to irrigation, nor would the power produced be used in major part for pumping for irrigation. It would be used mainly for general peak-load purposes and would earn money for re-investment in other water-control structures, mainly in California, winning political support in that State.

But as this Association has shown, it is not essential as a money-maker, because the water pumped into Arizona will earn more money than originally represented. The investment would be repaid in the main with interest; such an investment, if desirable, might better be made from the general treasury.

With respect to power, atomic fission plants will almost certainly be constructed within a decade or so to desalt sea water and produce energy at rates below those of Bridge Canyon, even for peaking purposes; either the consumers lose, or the project fails to pay out.

The Bureau's weighty disapproval was not visited on the other electric power component of the Central Arizona Project, Marble Canyon dam, proposed for construction above Grand Canyon Park; but the same objections are in large part applicable.

Marble Canyon is intended mainly to provide continuous pumping power to lift water from the Colorado River near the Mexican border into central Arizona. Its

power will cost at least 4.2 mills; coal-fired plants could probably produce it now at less than 5 mills, and such costs are dropping rapidly. To the hydro-power costs must be added a heavy subsidy to irrigation in portions of principal and interest never repaid to the Treasury. The cost at privately-owned coal-plants may therefore be closely comparable to Marble Canyon if honestly accounted. Responsible public officials will probably insist on a much more severe inquiry into this question before making irreversible decisions.

The Bureau of Reclamation has stated recently that very large coal-plants (capacity about that of Marble Canyon) operating at high load factor (where, as at Marble Canyon, the job is steady pumping) may soon get costs down to 3 or 4 mills or less; if so, Marble Canyon cannot be justified for pumping.

But regardless of coal, the same advance of nuclear fission which would impair the solvency of Bridge Canyon, threatens Marble Canyon as well. The large nuclear plants will produce firm power at from 3 to 4 mills; the probable advent of the hydrogen-fusion process somewhat later will bring these costs down to between 2 and 3 mills. The ability of Marble Canyon to pay out in 50 years against such competition must

be doubted as a wise projection.

The American people are likely to conclude, as the discussion proceeds, that the esthetic and cultural values of the remaining canyons of the Colorado, including Marble Canyon, albeit above the park, are more important than even a substantial saving in electric power costs. The full development of all the remaining power potential of the river will never satisfy the growing need for power; the other sources will have to be tapped, and they will almost certainly be cheaper.

Both of these hydro-power projects have a grave disadvantage for the people of the Pacific Southwest: they will evaporate large quantities of the priceless water on which the entire economy of the region depends.

Moreover, the dams will as a matter of course be opposed vigorously by practically all conservationists; the region can get the water and power it needs more quickly by turning to methods like coal-fired steam plants, having broad national support, not powerful opposition.

A far-sighted Secretary of the Interior, hailing from the region, might well be giving more thought to research and development in solar energy. Sun power will drown no scenic canyons and add neither heat nor dangerous wastes to the atmosphere or waters of the earth.

The Bureau of the Budget has made another excellent suggestion: a National Water Commission, composed of distinguished persons drawn from outside the Government, to review supplies and requirements on a national basis. This Association has long urged the creation of a commission of this kind, composed of policy-minded persons, not operating specialists, to formulate standards and principles for the management of all water-related resources. It would complement the important work of the new inter-departmental Water Policy Council. The Bureau's suggestion could be a long step in a good direction. —A.W.S.

Save the Redwoods!

California is about to drive a big highway through the Jedediah Smith Redwoods State Park.

Only an outpouring of protest can stop it. Letters should be addressed to: The President, The White House, Washington, D. C., and to Governor Edmund G. Brown, Sacramento, California.



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Front cover photograph courtesy National Park Service

South of Carlsbad Caverns National Park, the Guadalupe Range breaks through the New Mexico-Texas state line in a great triangle of limerock which, trending south for many miles, is terminated by the imposing wall of El Capitan, of geological renown, and 9000-foot Guadalupe Peak. The unusual suite of plants and animals of the Guadalupe, the wilderness character of most of the range, its sharply delineated geological story, and its inspiring scenic qualities have convinced the Park Service and many conservationists that the Texas portion of the Guadalupe Range may well be qualified for protection as a major national park.

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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NATIONAL PARKS ASSOCIATION, 1300 NEW HAMPSHIRE AVENUE, N. W., WASHINGTON, D. C. 20036

A vast West Texas ranch and a Park Service scientific study area may be united to create

A Guadalupe Mountains National Park

By Weldon F. Heald

Photographs courtesy National Park Service

THERE IS A MAN IN WESTERN TEXAS who not only owns the Lone Star State's highest peak, but whose goat ranch is big enough and spectacular enough to make a national park. His name is Mr. J. C. Hunter, Jr., and he owns 122 square miles in the Texas section of the Guadalupe Mountain Range. This king-sized private realm contains some of the most rugged and exciting scenery in the Southwest. Mr. Hunter is favorable to selling his land to the Federal Government; the National Park Service recommends its purchase by the Department of the Interior for park and recreation purposes; and bills have been introduced in both Houses of Congress by Texas representatives which, if passed, will create a Guadalupe Mountains National Park.

The cost of Mr. Hunter's ranch would be \$1,500,000. A goodly sum, certainly, but trifling compared with the investment in a two-man space flight to the moon. Furthermore, the expenditure would be a permanent investment for the well-being and enjoyment of generations of Americans to come. People are going to need more and more escape-hatches from the crowds, the pressures and problems of modern life. So, while we still have the chance, it behooves us to provide retreats where harassed humans can experience the inspiration and refreshment of the natural world as God made it. Guadalupe National Park would be just such a place.

The area is outstanding scenically, geologically, zoologically and botanically. There is nothing quite like it anywhere else in the United States. The Guadalupe Mountains extend southeast to northwest for fifty-five miles, and are twenty to thirty miles wide. Although largely in New Mexico, they thrust a triangular wedge southward over the line into trans-Pecos Texas. Measuring about ten miles to the side, this portion is the grand climax of the range. Here the remnants of an ancient, rolling upland have been cut and riven by deep, tortuous canyons into lofty, pine-forested islands and peninsulas-in-the-sky. Near the end of the wedge, erosion has been so severe that the upland's west

edge stands as a row of cliff-flanked summits, dominated by 8751-foot Guadalupe Peak, highest point in Texas. The extreme southern tip is rock-capped El Capitan, rising abruptly a vertical mile above the highway between El Paso and Carlsbad, New Mexico.

Exposure of Permian Limestone

The whole Guadalupe uplift is a huge block of limestone that was laid down in Permian seas some 200 million years ago, then raised thousands of feet above the surrounding country during one of the earth's mountain-building convulsions, perhaps 75 million years ago. Geologists call the formation the Capitan Reef, and at the south end fully 4000 feet of these Permian rocks are magnificently exposed. On the southeastern flank, over the line in New Mexico, is Carlsbad Caverns National Park, a 43,404-acre preserve containing the world's largest known limestone cavern. But Carlsbad is only one of many, for the entire Guadalupe range is honeycombed with waterworn limestone caves, and some speleologists believe that these mountains could be traversed from end to end underground.

The National Park Service conducted field investigations in the Texas portion of the Guadalupe in 1958, 1961 and 1963. Although top-priority interest was assigned to the geology of the range, its ecology and scenery were found to be unique and fully worthy of park status. The investigations also revealed that the outdoor recreation potential is high, and tentative plans have been made to develop visitor use and enjoyment of the area should the proposed Guadalupe National Park become a reality. However, the idea of preserving this superlative piece of the primitive Southwest for the benefit of the public is nothing new; it was suggested as a possible national park as far back as 1925, and also as a state park in the 1940's.

The reasons for the continued enthusiasm are many. Take the great variety of animal, plant and bird life, for example, which is noticeably significant to the layman as



From a vantage point on Bush Mountain on the western escarpment of the Guadalupe Mountains in Texas, the eye wanders north along the range into New Mexico in the far distance. At left in photo are the Brokeoff Mountains.

well as the scientist. The Guadalupe Mountains rise between the broad Pecos River Valley on the east and the desert salt flats and intermittent playa lakes of the Delaware Basin to the west. The former is about 3000 feet in elevation, while the latter is some 600 feet higher. So, within the space of a very few miles there is a transition from a climate characteristic of northern Mexico to one resembling southern Canada. In fact, the differences in temperature between base and summit can be as much as 20° F. Rainfall and snowfall, too, rapidly increase with altitude, and the 25 to 30 inches of average annual precipitation at the top is double that of the surrounding lowlands.

Such sharply contrasting conditions of temperature and moisture make for an interdigitating mosaic pattern of

differing vegetation, and few areas of like size can exhibit more scrambled ecologies, whose diverse natures depend on slope, exposure and altitude. At the mountains' foot are cactuses and drought-resistant shrubs typical of the Chihuahuan Desert—plants such as the walking-stick cholla, agave and creosote bush. But on the outer bajada slopes the one-seed juniper grows, and the canyons support stream-side broadleaf trees and a few ponderosa pines. Higher up the vegetation increases, and the upper canyons and summit highlands are covered with open stands of ponderosa and limber pines, pinyons, alligator juniper, some Douglas fir, and a few groves of quaking aspen and other deciduous trees, and steep chaparral slopes.

Thus, four of North America's seven climatic life zones are represented in the Guadalupe: open slopes of the

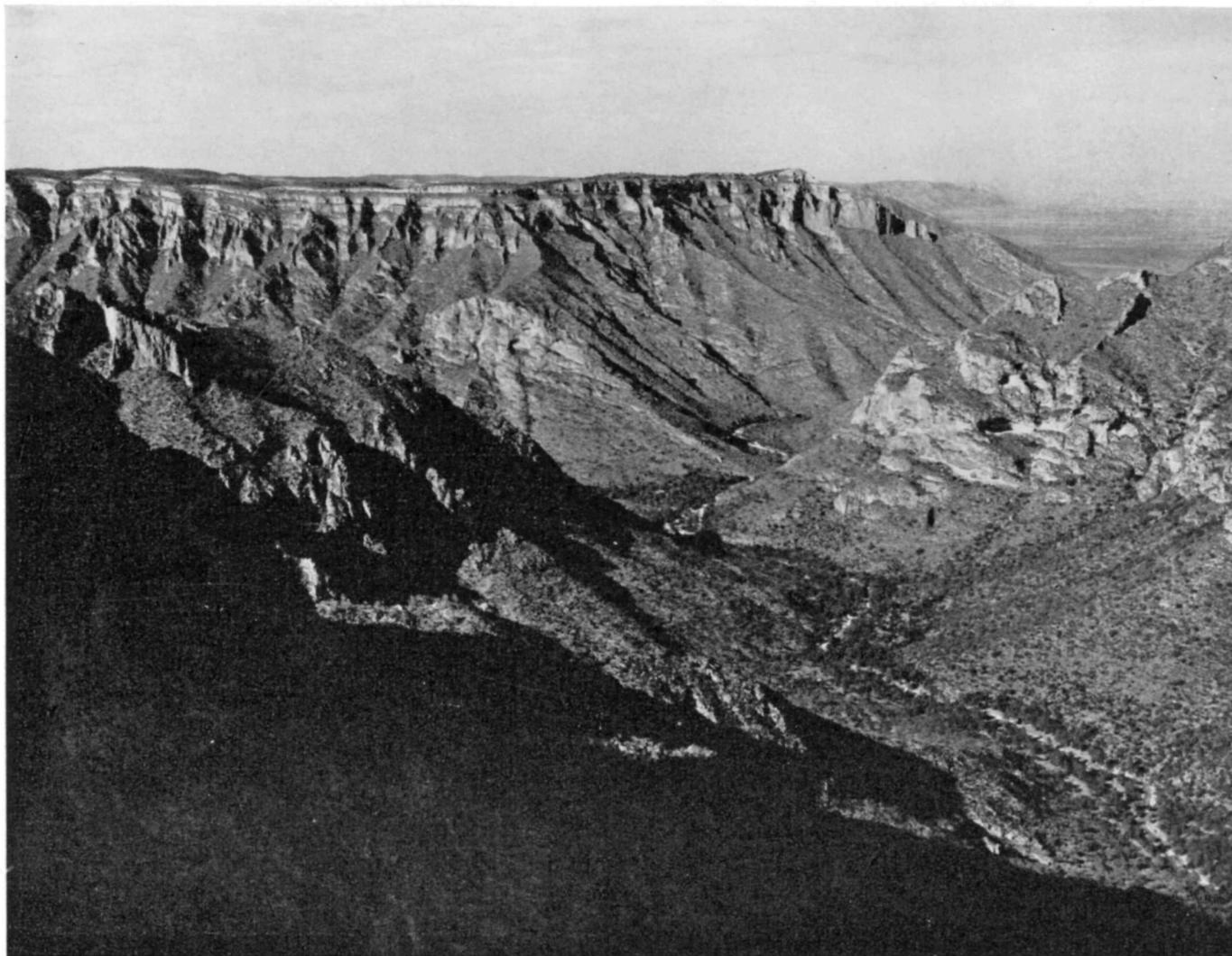
lower canyons show Lower Sonoran plant and animal associations; ridge tops are Upper Sonoran; shaded draws and canyon floors have Transition growth; and there are spots on the highest peaks with Canadian influence. The last are probably relicts of the cool, damp Pleistocene Epoch, and have for several thousand years survived the change to warmer and dryer conditions of more recent times.

These various environments have resulted in profuse animal life, which fortunately has had almost complete protection for the past forty years. Except for very limited hunting in the highlands, little disturbance of the wildlife balance has occurred. Mule deer are plentiful from base to summit of the range, and more than 300 elk roam the Texas section of the Guadalupe. The native species of Merriam elk became extinct many years ago, and the present herd is the increase from 44 Nelson elk introduced by Mr. Hunter's father in 1925 and 1926. In addition, wild turkeys, planted in 1954, have become well established. A few mountain lions and black bears still linger in the rough

upper canyons, and recent reports indicate that a small remnant band of bighorn sheep inhabits the high cliffs a few miles north of Guadalupe Peak. Among the smaller mammals are bobcats, raccoons, ringtail cats, skunks, rock squirrels, rabbits, foxes and porcupines. Of course, lizards and snakes like the country, too; and some 200 species of birds were listed during the summer of 1960.

Although Spaniards traversed both the Rio Grande and Pecos river valleys in the 1500's, it was not until 350 years later that white settlement began in the vicinity of the Guadalupe. At that time these mountains were a stronghold of the savage and war-like Mescalero Apache Indian, and most travelers wisely gave the mountains a wide berth. However, the original Butterfield Stage Line passed the southern tip of the range, following much the same route as the modern highway; and the ruins of a stage station built in 1858 may still be seen near Pine Spring. Evidences of prehistoric Indian occupation are numerous, and include remains of pottery, metates, utensils and other

Below, the juncture of North and South McKittrick Canyons on the east flank of the Guadalupe Range; North McKittrick enters from the left in foreground. A portion of South McKittrick is already under preservation.





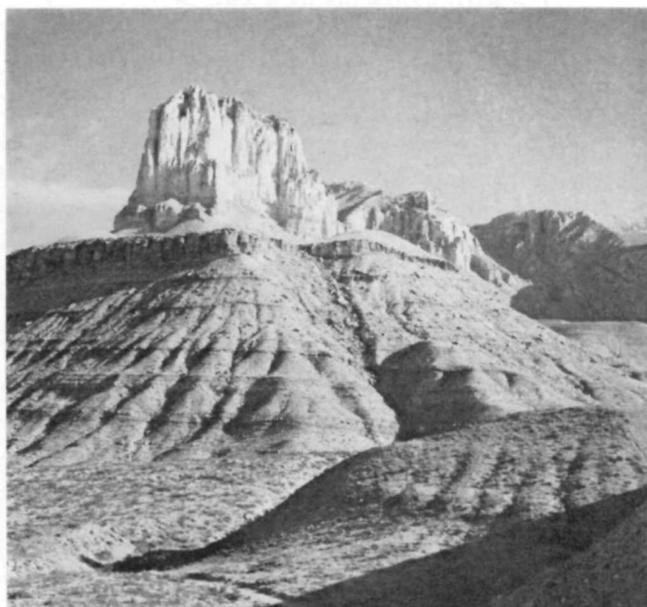
In an aerial view from the southwest, the Guadalupe Range, projecting south from New Mexico into trans-Pecos Texas, terminates in a sharp wedge of Permian sedimentary rocks. Just to the right of center in the photograph is El Capitan, behind which Guadalupe Mountain rises to an elevation of 8751 feet.

Photographs of El Capitan like that below have long been used to illustrate textbook discussions of the Permian rocks of North America. Detail of the Capitan bioherm, or fossil reef, is well exposed in many places throughout the Guadalupe Mountain range.

artifacts, as well as a large number of pictographs in caves and sheltered overhangs throughout the mountains. The area's prehistory dates back thousands of years to the era of the musk-ox, early horse and mammoth; but much field work needs to be done by archeologists to fill out the story of past Southwestern Indian cultures.

Perhaps the most striking features of this lofty limestone reef at the south end of the Guadalupes are geologic and scenic—the twisting, gorge-like canyons and the airy, pine-forested uplands above, with their far-flung panoramas over mountains, deserts and plains. Near the southernmost point, Pine Spring Canyon bites deeply into the range and heads back among the highest peaks. Farther northeast, McKittrick Canyon breaks through the mountain escarpment in a single, gate-like opening. However, a couple of miles upstream it divides into three tributaries. Called South McKittrick, Devils Glen and North McKittrick Canyons, they collectively drain a large part of the highlands area.

South McKittrick has a permanent stream which musi-



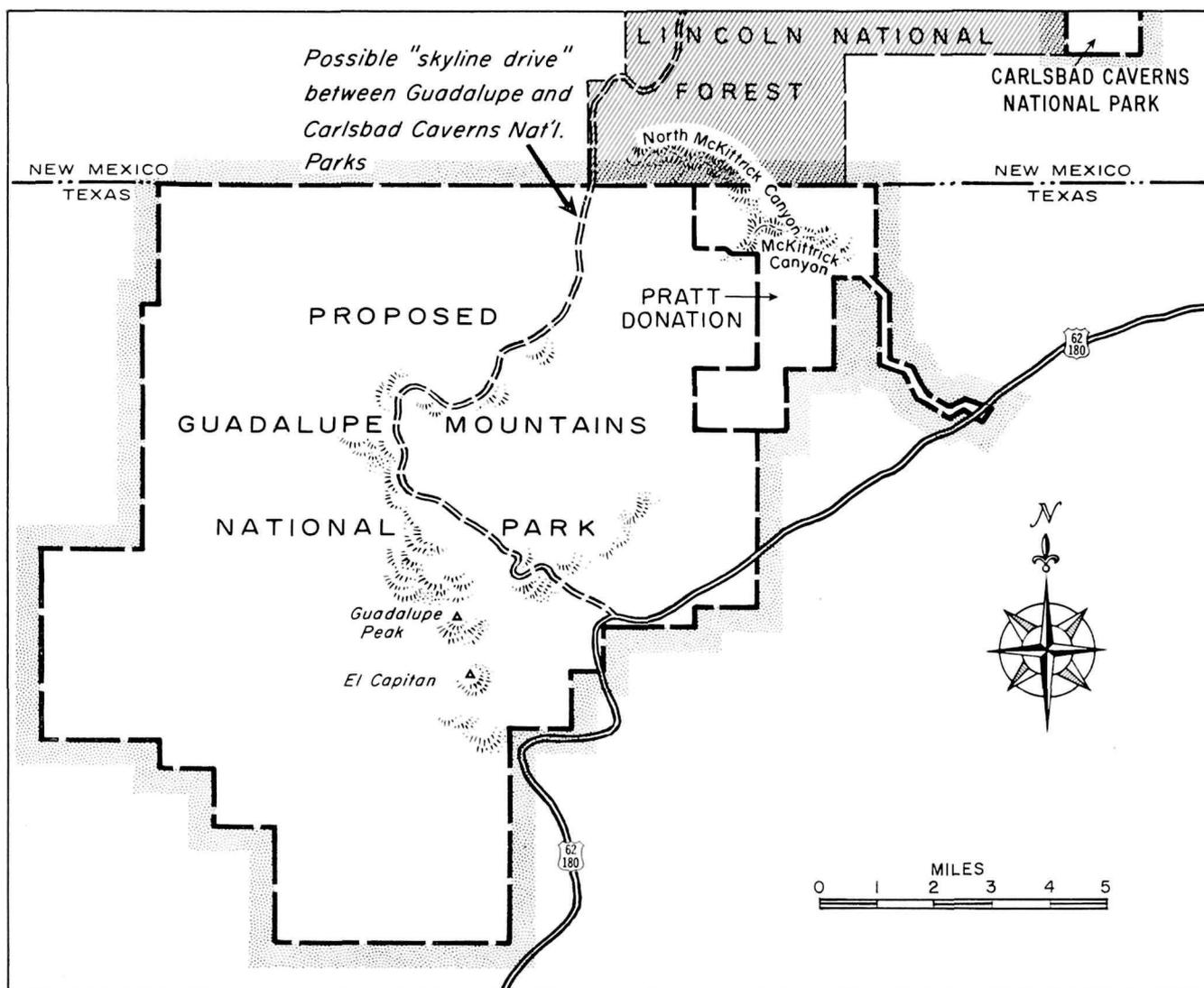
cally cascades down its rocky bed between borders of arching trees. Above, the canyon walls rise in sheer crags and pinnacles 1500 to 2000 feet against the sky. Bluegill and rainbow trout have been planted in the creek. Although not natives, they now reproduce naturally. All in all, it would be difficult to find a more delightful, secluded retreat than South McKittrick Canyon, and many consider it to be the scenic gem of the Guadalupe Mountains.

This eastern end of the triangle, north to the New Mexico border, is not a part of Mr. Hunter's ranch, although contiguous to it. Containing 5632 acres, the land was generously presented to the Federal Government by Mr. Wallace Pratt in 1961 as a nature preserve, and is administered by the National Park Service. If Congress authorizes purchase of the Hunter holdings, the total area of the new park would be about 120 square miles.

Moreover, should the park be established, the United States Forest Service will cooperate by creating a large recreation area in adjoining Lincoln National Forest to the north in New Mexico. So, there is an excellent chance for a magnificent new two-state scenic, scientific, and outdoor recreational area in the Guadalupe Mountains, covering a couple of hundred square miles. Both the Park Service and Forest Service have drawn up preliminary plans for access roads, camp- and picnic-grounds, visitor facilities, interpretive programs and exhibits, and a "skyline drive" along lofty Guadalupe Ridge to connect the proposed park with Carlsbad Caverns.

Our national parks have been acquired in many ways. But never before has the addition of a major unit of the system depended on the purchase of one man's goat ranch. Undoubtedly, this could only happen in fabulous Texas. ■

Shown below are the boundaries of proposed Guadalupe Mountains National Park of about 72,000 acres adjacent to the New Mexico state line in trans-Pecos Texas. A few miles to the northeast is Carlsbad Caverns National Park in New Mexico; a small portion of the park is shown on map. Shown also is the location of the recent Pratt donation to the park system, presently a scientific study area; the Pratt donation would be included within a Guadalupe Mountains Park. The map outlines the route of a possible "skyline drive" that would connect the new park with Carlsbad Caverns Park; proposals now under discussion make no provision for such a drive, but idea may come to life in the future.



Map by Federal Graphics

PIETROGLYPHS

In California's Lava Beds National Monument, as elsewhere, protection of prehistoric man's cryptic "messages" presents a serious problem

By Ione Reed

MAN IS UNIQUE AMONG ANIMALS AS a creature that defaces and destroys for the sole purpose of feeding the vanity, or, perhaps, attracting attention that could otherwise never be gained. The human propensity for carving initials on rock-surfaces is, of course, not one recently acquired. In America, it made itself apparent in the nation's younger days, and was commented on at a fairly early date; a geologist of the first part of the nineteenth century once remarked that the bare summit of one of the higher New England peaks was literally covered with the carved initials of "the most unimportant persons."

The present case in point is the treatment that has been accorded the petroglyphs in the northeastern part of California's Lava Beds National Monument. These drawings, or more properly, rock-carvings, follow the base of a huge pumice-stone cliff for half a mile or more. Very little is known about them other than that they are very old, much older than the Indian cultures of the past few centuries. It is understandable that the National Park Service hopes to preserve them, not only for the enjoyment of visitors but for the possible clues they may offer in solving the tantalizing mystery of an ancient stone-age people.

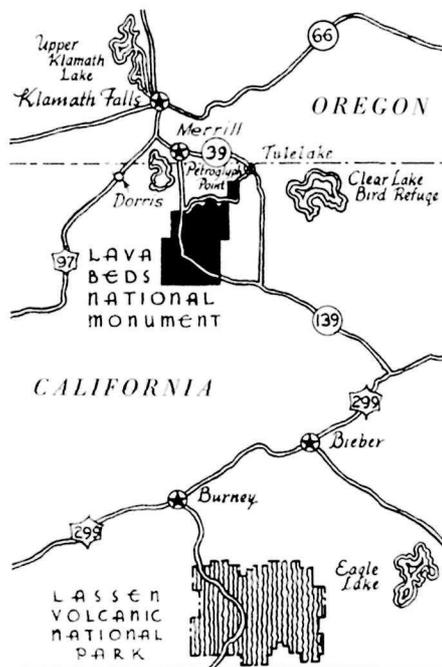
But the public has been unable to resist the lure of the soft pumice, which is embellished with initials distinctly modern; these are often tastefully entwined in hearts or other embellishment, alongside or even upon the original carvings.

The petroglyphs are protected by a fence that is totally inadequate for the purpose. The writer knows, for she crawled through it. The park rangers

do their job well. Again the writer knows it, for she had no more than clicked the shutter of her camera when one appeared from nowhere, like an irate genii, to ask if she had done any "art work" on his treasures. After being reassured, the ranger showed the writer where Park Service personnel had "erased" initials by chipping them from the pumice, but at the expense of dark-colored patches that were themselves unsightly.

One section of the rock-carvings had been so obscured by the work of present-day artists that the Park Service did not bother to fence it. The ranger told the author gloomily that it had originally been one of the finer sections because, as it faced slightly away from the prevailing winds, erosion had proceeded more slowly than in the sections exposed to the full force of the weather.

Wind and weather do their share of damage to the rock-carvings, of course. The carvings were originally colored in reds and yellows, but only faint traces of color are now discernible. However, if man would do his part in preserving, rather than defacing, the carvings should last many years—perhaps long enough to enable us to learn something of the mysterious people who left them there. (Illustrations on following page).





Photographs by the author

Above: the petroglyphs, or symbolic rock-carvings of prehistoric peoples, found at Petroglyph Point in the northeastern part of California's Lava Beds National Monument have been defaced by careless or unthinking persons. At right: these cryptic stonecarvings, in the same locality within the monument, still show faint traces of the original red and yellow pigments applied by their unknown inscribers.



Airborne instruments have been helpful in probing a geological oddity within the newly created Canyonlands National Park

UPHEAVAL DOME

By Robert H. Rose

THE RECENTLY ESTABLISHED Canyonlands National Park in southeastern Utah is a land of mystery and fantasy. But none of the park's myriad features that illustrate the handiwork of nature is more mysterious and peculiar than Upheaval Dome, located in the "Island in the Sky" sector about five miles east of the Green River.

Upheaval Dome is mysterious, for not all of the various geologic processes and events connected with its origin are fully known. It is peculiar, in that its appearance and form set it apart from other features nearby. Superlatives are fitting in any description of the scenery and natural wonders of the area; even geologists overcome their inhibitions toward superlatives when they describe the varied phenomena of Canyonlands National Park and vicinity. They have characterized Upheaval Dome as one of the more spectacular physiographic features in all of the colorful southeastern Utah country.

Upheaval Dome lies near the center of the northwest quarter of the Upheaval Dome quadrangle map. This quadrangle is located within a sector of the Colorado Plateau immediately north of the junction of the Green and Colorado Rivers. The terrain is dissected by deep tributary canyons characteristic of Utah's fabulous canyonlands country, and such erosional features are quite fully developed in the Upheaval Dome and surrounding areas. Motorists can drive within a short distance of Upheaval Dome over a road which leaves U. S. 160 about 19 miles

north of the Colorado River town of Moab.

In his recent book, titled *Standing Up Country*, Crampton described Upheaval Dome as "a multicolored eroded conical dome surrounded by a ringlike syncline about two miles in diameter." The outer flank of the encircling syncline, or down-folded rock layers, is uniformly a half-mile wide, giving three miles as the total diameter of the entire structure. The center of Upheaval Dome, as viewed from some nearby vantage point, resembles the huge crater of a volcano; a crater approximately 4500 feet across from rim to rim and about 1600 feet deep. Erosion has breached the northwest sector of the rim, creating a deep gap. The apex crater and deeply-incised gap comprise the head of Upheaval Canyon, which continues northwesterly to its junction with the Green River five miles away.

Appearance Is Deceptive

Upheaval Dome resembles a volcano in form and color, yet all of the exposed formations are sedimentary in origin. The exposed formations, and rock-strata known to underlie the area at greater depths, range in age from Carboniferous to Jurassic on the geologist's time-scale. Thus the origins of the involved rocks range back into geologic time from some 300 million years to about 150 million years.

These strata, from oldest to the youngest, include the Paradox, Hermosa, Rico, Cutler and Moenkopi for-

mations; the Shinarump conglomerate; and the Navajo sandstone. Within Upheaval Dome's crater, the lowermost and oldest rocks exposed belong to the White Rim member of the Cutler formation, of Permian age. The crater rim consists of the massive, cross-bedded, cliff-forming Wingate sandstone, of probable Jurassic age. Between the Cutler at the bottom and the Wingate on the rim, in ascending order, lie the Moenkopi, Shinarump and Chinle strata. On the outer slopes of the dome, but stratigraphically higher than the Wingate, are found patches of the Kayenta formation of varying sizes and thicknesses, which run the color-gamut from white to buff, and include shades of pink, lavender and red-brown. Above the Kayenta, but outward and still lower along the slopes of the cone, appear the Navajo beds of variegated colors that range from light buff to pale shades of gray and red.

From the names it will be recognized that some of these formations are widely distributed throughout the Colorado Plateau region. The Moenkopi and Chinle formations, and the Shinarump conglomerate which stratigraphically belongs between the Moenkopi and Chinle, are widely exposed throughout the vast Painted Desert country. The famed Rainbow Bridge is carved in the massive Navajo sandstone, for the most part, with lower buttress portions resting atop the Kayenta formation.

With rocks in its crater and surrounding portions so brilliant it is

little wonder that Upheaval Dome is usually regarded as a volcano by those viewing it for the first time, and unaware of the scientific studies which have been made. Great boulders as big as houses, composed of the White Rim member of the Cutler formation, lie helter-skelter on the bottom of the crater. Pinnacles and ridges of the same formation dominate the floor of the depression, and give the whole ensemble the appearance of a smaller crater within a larger crater.

Close observation and detailed study of Upheaval Dome and its apex crater fail to reveal the presence of igneous rocks, or rocks of any kind showing the effects of alteration by steam, hot gases, or both. We must, therefore, rule out the possibility that Upheaval Dome is a

volcano, or that volcanic activity produced the deep crater in its summit. This does not, however, eliminate the possibility that molten rock material might have moved upward and solidified at considerable depths beneath Upheaval Dome and the immediate vicinity.

What, then, are the conclusions which may reasonably be drawn from past observations and studies? In 1936, Bucher advanced his "cryptovolcanic" theory of origin of Upheaval Dome—a theory which envisions the explosion of steam or hot gases emanating from a hidden source, such as a volcanic plug lying at some relatively shallow depth below the center of the crater. Other geologists familiar with the locality have taken a rather dim

view of Bucher's cryptovolcanic theory because of the lack of tangible evidence. Bucher's theory is not entirely without logic or validity, however, because it was based in part on the fact that the form of Upheaval Dome resembles that of known cryptovolcanoes elsewhere.

Much research has been required to prove that Upheaval Dome cannot be classed as a cryptovolcano. Based on studies started before 1930 and fully reported upon nearly a decade later, McKnight concluded that Upheaval Dome is a salt dome rather than a cryptovolcano. He called attention to the abundance of salt within the Paradox formation underlying wide areas of this portion of the Colorado Plateau. Despite the superficial appearances of

Several theories have been advanced to account for the volcano-like aspect of Upheaval Dome in Canyonlands National Park, seen from the air in the photograph below. The view is toward the northwest, and shows Upheaval Canyon breaching the Dome's "crater" at the upper end of its course to the Green River, visible in the background.

National Park Service photograph: M. Woodbridge Williams



violent disturbance, McKnight presented evidence for the view that the deformation of the rocks in Upheaval Dome occurred slowly and perhaps intermittently. Moreover, the salt-dome theory, as developed by other geologists and applied to Upheaval Dome by McKnight, is strengthened by the fact that similar features, known to have been produced by the plastic movement and doming of salt, do occur elsewhere in the United States and in many other places throughout the world.

In support of the salt-dome theory of origin, McKnight described the scientific analyses and experiments of

Nettleton. These experiments involved the local intrusion of heavier stratified materials by lighter plastic substances such as occurs when salt under pressure is pushed upward and into and through sandstone, shale and other relatively denser types of strata. Intrusions effected under these artificial conditions, Nettleton demonstrated, lead to the creation of a form that is circular in plan, with a central dome surrounded by a peripheral trough, or syncline. This description fits Upheaval Dome quite well.

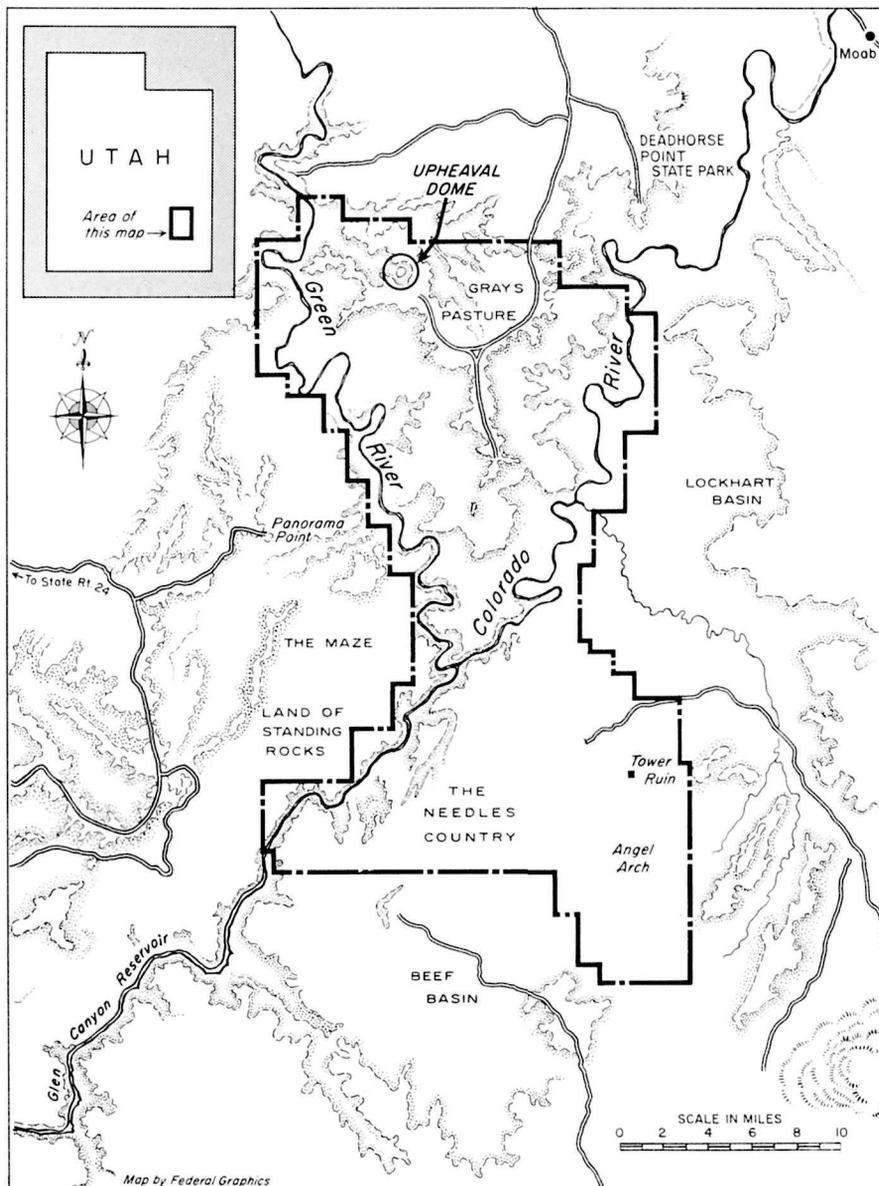
The inward dip of the Navajo sandstone in the outer flank of the syncline

encircling the central portion of Upheaval Dome varies between 15 and 30 degrees. The outward dip of the strata on the inner flank circumscribing the lower portion of the central cone ranges between 30 and 90 degrees, with 40 to 60 degrees as the average. The apex crater wall consists of the eroded upturned edges of strata which dip outward and downward from the axis of the cone.

If the structure indicated in the attitude of the strata within Upheaval Dome, including the surrounding syncline, is the result of inward movement and doming of salt from a source such as the Paradox formation, some mechanism must have triggered the process. Perhaps the process was initiated by weakening of rocks over the central portion of the dome by erosion. Continued erosion could have made the overburden in the circular area of the syncline correspondingly heavier than the overburden at the center of the dome. This could have caused the inward movement of the salt from the underlying Paradox formation and its accumulation as a deep-seated domal mass far beneath Upheaval Dome, and a corresponding thinning of the salt accompanied by synclinal warping of the overburden in the circular area immediately adjacent to the dome. A process of this kind would not have required the influence of inward thrusts from distant sources.

For more than a decade the salt-dome theory of origin of Upheaval Dome was quite widely accepted. The absence both of igneous rocks and evidences of alteration by steam or hot gases in the locality seemed to rule out any possibility that Upheaval Dome might be a volcano or a cryptovolcano. However, in 1958, Joesting and Plouff of the United States Geological Survey reported on the results of aeromagnetic and gravity investigations at Upheaval Dome and in the surrounding area. These investigations do not topple the salt-dome concept, nor do they restore the cryptovolcanic theory of origin of the crater. They do, however, lend strong support to the idea that upthrusts and intrusions of igneous material at considerable depth in the geologically remote past have contributed to the general elevation of the immediate locality, and that such intrusions have influenced the subsequent

The map locates the boundaries of newly created Canyonlands National Park in southeastern Utah, and, in particular, Upheaval Dome and Grays Pasture, both discussed in this article.



doming of salt at lesser depths beneath Upheaval Dome.

"Magnetic maps" produced from these surveys indicate that a domal mass of igneous rock measuring about five miles across lies at about sea-level beneath Upheaval Dome, and that an igneous mass of similar size and shape underlies Grays Pasture, some six miles to the southeast, at about 1000 feet above sea-level. Since the average elevation of the bottom of the crater within Upheaval Dome is about 4800 feet above sea-level, 4800 feet is also the approximate depth to the domal mass of igneous material. The ground elevation at Grays Pasture is about 6000 feet, indicating that the domal mass here lies at a depth of approximately 5000 feet.

Geophysical surveys and structural and stratigraphic studies prove quite conclusively that the upper surface of the great general basement complex of

crystalline rocks underlying this sector of the Colorado Plateau is about 2000 feet below sea-level at Upheaval Dome, and perhaps as high as sea-level beneath Grays Pasture. Thus, these studies would place the top of the local domal mass in a position some 2000 feet above the general level of the basement complex at Upheaval Dome, and about 1000 feet above it at Grays Pasture.

Suggestions As to Origin

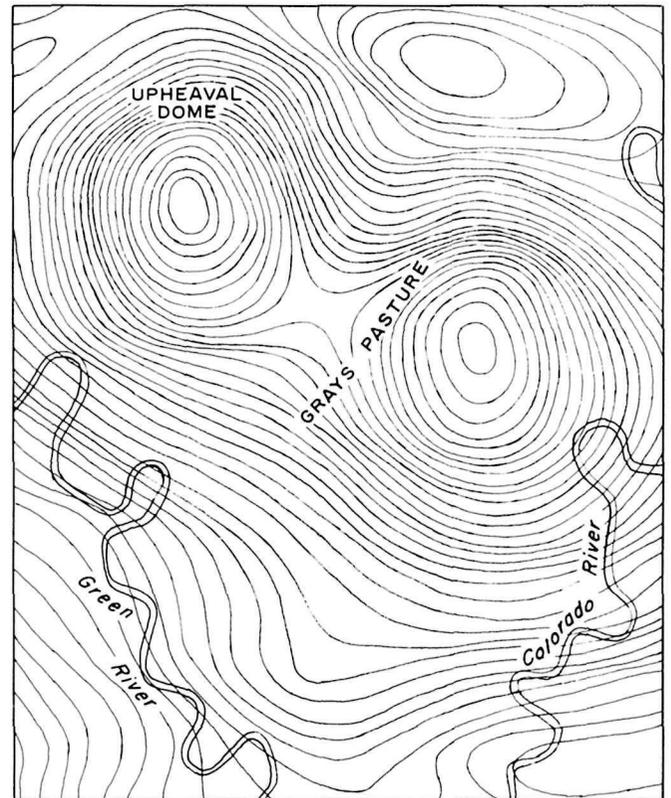
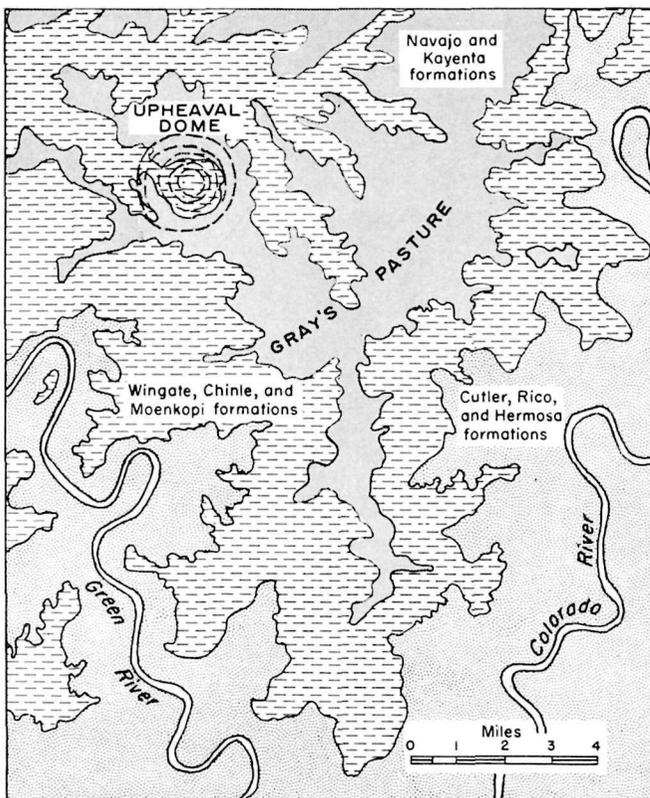
It is regarded as quite unlikely that these domal masses are as old as the basement complex itself—mere large "bumps" on its original upper surface. Joesting and Plouff suggest that they are either the result of a structural uplift of a segment of the basement, or of igneous intrusions built upon, or rising above, the basement. Rocks in the locality as old as Permian in age exhibit no expression of uplift of such

magnitude. It is concluded, therefore, that the structural uplift or domal intrusions would have to be older than the Upper Permian-age rocks which are the oldest formations exposed near Upheaval Dome and Grays Pasture.

"Overtones" with regard to the uplift or intrusion of igneous rock 1000 to 2000 feet higher than the level of the basement complex are indicated by additional geophysical surveys which have been made in the locality. More refined gravity surveys show the probable presence of a still smaller additional mass of igneous material under Upheaval Dome somewhere above the level of the five-mile-wide domal mass. It is thought that this might be an additional, smaller igneous mass that has penetrated the lower portion of the salt plug itself. Neither the salt nor this smaller igneous mass, if it is present, have as yet been exposed by erosion.

The more important of the dynamic

The maps below cover identical portions of southeastern Utah, and are based on the U.S. Geological Survey's Upheaval Dome, Utah, quadrangle map. The illustration at left shows the various rock formations that occur in the general vicinity of Upheaval Dome and Grays Pasture, and the areal extent of their outcrops. The map at right shows how the same terrain "looks" to an aerial magnetometer flown at 8500 feet. The magnetometer has here recorded changes in the strength of the earth's magnetic field, and a map has been plotted on which points of equal magnetic strength are connected, much as points of equal height are connected on a topographic map. The magnetometer shows that there are not one but two prominent, symmetrical "highs" in the Upheaval Dome area; but there are no surface indications of the "high" underlying Grays Pasture. Just north of the two "highs" a magnetic "low" is seen. The two maps have been adapted for the purposes of this article from the publication "Guidebook to the Geology of the Paradox Basin," and are used here by courtesy of the Intermountain Association of Petroleum Geologists.



Maps by Federal Graphics

earth processes and events contributing to the present structure and form of Upheaval Dome began prior to the deposition of the sediments of the White Rim member of the Cutler formation more than 200 million years ago. At this stage thousands of feet of sediments, older than the Cutler formation, already lay as a thick overburden on the surface of the region's complex of crystalline basement rocks.

The first significant development in the sequence of geologic events was the rise of the mass of igneous rock, either as an upthrust segment of the basement or as an upward intrusion, forming domal masses, each about five miles across, beneath Upheaval Dome and Grays Pasture. This doubtless produced an upwarping of the overlying strata, but the formations are so old and so deeply buried that no effects of this initial doming are in evidence today.

Next in the sequence came the deposition of sediments, including a considerable thickness of those older than the White Rim member of the Cutler formation. During this long period of deposition it is probable that the inward movement and accumulation of salt beneath Upheaval Dome began. This process could have been facilitated by the earlier domal massing of the igneous material, which might have weakened the overburden at this point. The plastic movement of salt and its

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accumulation beneath Upheaval Dome are envisioned as occurring intermittently through geologic time into the Tertiary Period. In the time scale of geologists, the Tertiary Period began some 70 million years ago. Perhaps it was during the Tertiary phase of salt movement that the encircling syncline was formed.

Next in the series of events, as envisioned, there occurred the intrusion of a relatively small mass of igneous material to higher levels into the large salt core that had probably already been developed by this time. If this igneous intrusion, as inferred from delicate gravity surveys, did occur, it was too small to generate steam or hot-gas explosions of the type associated with similar features elsewhere, known to be cryptovolcanic in origin.

Uplift and erosion have been the dominant processes at work during the final stages in the panorama of events at Upheaval Dome. During eons before the present, erosion continued to strip away the great overburden of undetermined thickness, finally to expose the formations prevalent in the area today. This sequence, if portrayed in time-interval fashion, would depict the beginning of the downward cutting of Up-

heaval Canyon, the breaching of the conical dome, and the removal of the broken, shattered and deformed rocks of the crater now situated in the apex of Upheaval Dome.

In summary, therefore, Upheaval Dome may be regarded as a great salt dome in which localized uplift and intrusion of masses of igneous material have played a role. As erosion and other geological processes continue, perhaps the salt core, and the small igneous intrusion believed to have invaded it during its later stages of accumulation, will become exposed.

Much of the lure and mystery of Canyonlands National Park revolve around the fact that many of its principal features will continue to be subjects of future observation and study. One has only to name other prominent features such as the Needles, the Land of Standing Rocks, Druid Arch, Angel Arch, and Cataract Canyon to sense the lure and excitement awaiting future scientists and laymen alike as they seek to better understand the wonderful and devious ways by which nature shapes the face of the land. The national parks of America have been aptly characterized as the nation's crown jewels. Upheaval Dome, and the fabulous Island in the Sky sector in which it is located, go far toward making the new Canyonlands National Park one of the most precious and beautiful jewels in the priceless diadem. ■

THE FIRST RAIN

Tear-pressed and ever swelling pools . . .
First one, then two . . . then showers
So gently wash the parched and crusting face
Of earth and all within her keep.
Blithe, aromatic airs take flight
From crevices and pores of shale
Where rivulets explore and seep,
Then sweetly quench an acrid, burning thirst.
Once dusty-green of blade and wilting limb
Exposed and bathed o'er all . . .
She smartly dons a lacy-green attire
And breathes a richer, purer, fresher air.
Embellished, cleansed and shining new,
She smiles a golden smile's delight,
As flashing rays of sun subdue
The sweeping flow of image-dancing streams.

—JAMES T. STAPLES

WAR OF THE "NEVER SWEATS"

BY TIM ST. GEORGE

THE NAME OF PETER LASSEN speckles all California maps. There are probably more sites named after this restless, kindly explorer than any man who lived in the Golden State. Lassen gave his name to a national park, an active volcano, an entire county, an emigrant trail, a creek, a canyon, a mountain pass, a monument, and numerous other sites.

In 1839, gaunt and sinewy from long hours on the trail, Lassen rode into the Oregon country. He settled down, but only for a year. Restless, he packed again and wandered down into California, where he befriended two other pioneers, Captain John Sutter and an ambitious innkeeper, Isaac Roop. Almost at once, Lassen became intrigued with Roop's plan to form an independent territory to protect a lush and valuable tract of land called "Honey Lake." At Honey Lake, said Roop, the fish were always biting, crops practically grew by themselves, and living was so easy that residents of the area were called "Never Sweats" because of their natural reluctance to work.

Neither Roop nor Lassen believed that the Never Sweat land belonged to the State of California or the Territory of Utah. In 1856 they decided to seize it for themselves and adopt the easy-going philosophy of the Never Sweats.

Shortly afterwards, twenty residents of Honey Lake met at Roop's wayside inn and organized the Territory of Natagua, an Indian word supposedly meaning "woman." The capital was named Rooptown, although it is presently called Susanville, after Roop's pretty daughter. Everyone was assigned to a special task in the new "government," and Peter Lassen's job was to survey Natagua's boundaries.

It soon became obvious that Lassen's enthusiasm exceeded his engineering skill. Everything seemed to be in order when he submitted his maps, until someone discovered that Rooptown,

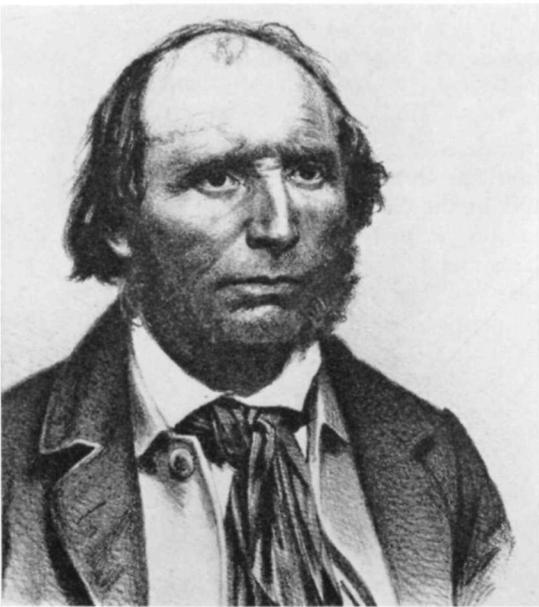
the capital, had been excluded from the Territory by several miles!

Lassen and his friends Roop and Sutter ignored the mistake, and went on searching for new land to conquer. When another "maverick" territory, "Sierra Nevada," was organized by residents of Genoa, they joined that venture too. This seemed like a reasonable course of action, for the "owners" of Sierra Nevada claimed Rooptown and part of Natagua as their territory.

The shock came when Congress got into the act by creating the territory of Nevada—an area which included both Sierra Nevada and Natagua. Soon Californians became wary, re-surveyed their legal State boundaries, and found that the coveted Honey Lake was actually a part of Plumas County in California.

The little band of Never Sweats, who prized both their land and their independence, reacted violently to the new land-grabbing game. There was talk of war, and when Plumas County sent tax collectors into Honey Lake in 1859 the Never Sweats greeted them with an armed revolt. At the time Peter Lassen had temporarily left Honey Lake on a prospecting trip. On the way Lassen and his companions were murdered by a still-unknown Indian; both the murderer and the incident were slowly lost in the haze of history.

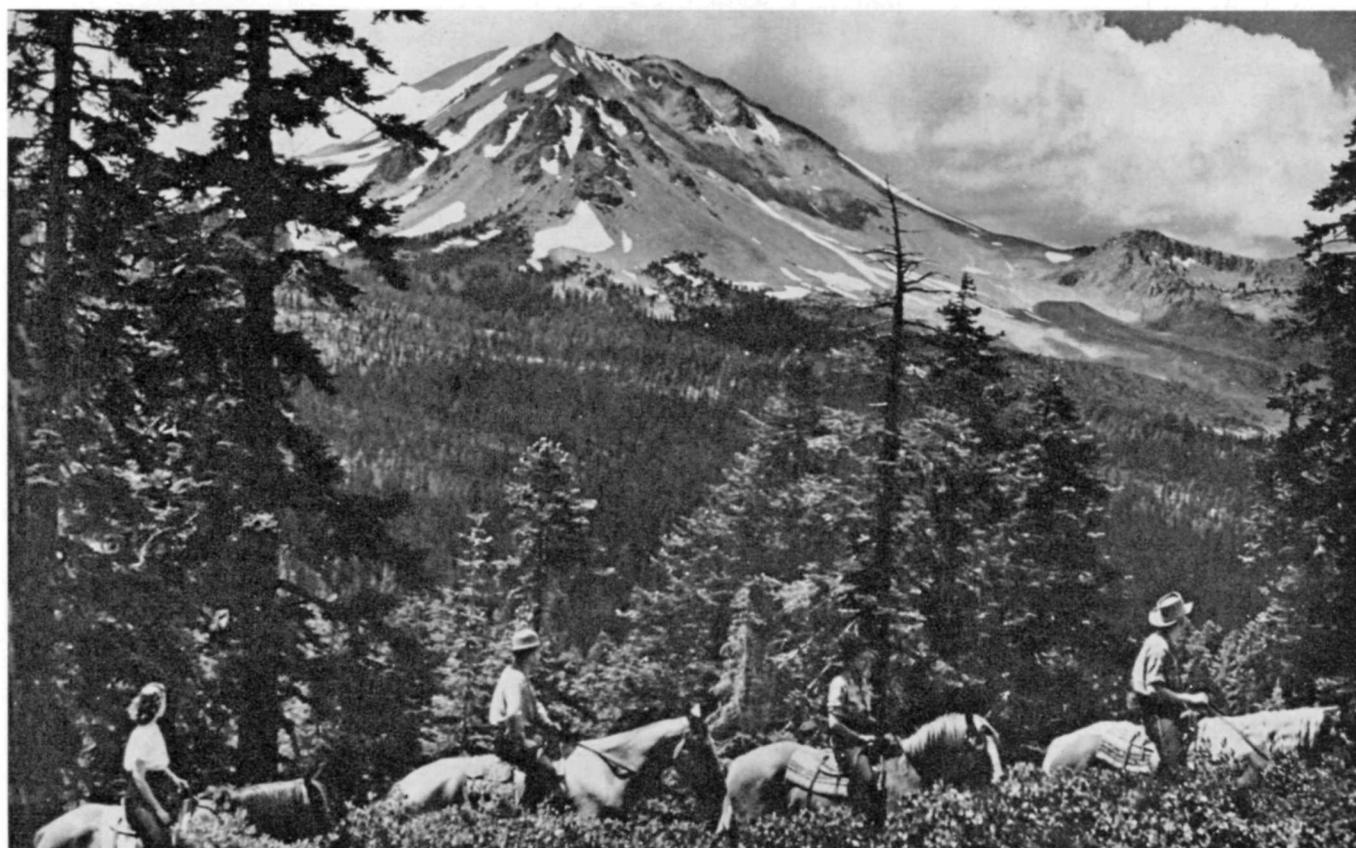
As a memorial to his friend, Roop sought out the only active volcano in the United States of the day, and named it after his murdered friend. Eventually the area was preserved as Lassen Volcanic National Park. Ironically, however, Lassen's own surveying mistake removed the park area from the county which was also named in his honor. However, the park remains, to be forever preserved as Lassen's most important memorial, and a reminder to each new generation of Americans of the freedom of spirit and the tenacity of the early Western pioneers. ■



Explorer Peter Lassen found time about 1850 to pose for photograph, later copied in this pencil sketch by admiral R. H. Vance.



Smoke and ashes billow 10,000 feet above erupting Mount Lassen in this stormy 1915 scene. Below, the area as it is today in tranquil Lassen Volcanic National Park. Both photographs courtesy of the National Park Service.





Within Cape Cod National Seashore, near the village of Wellfleet, the National Park Service has erected a small interpretive shelter on the site of Guglielmo Marconi's successful attempt, during the winter of 1903, to send trans-Atlantic radio messages.

Cape Cod's Marconi Station Site

By Charles R. Koehler

Photograph by the author

“**P**ERHAPS SOMEDAY A MONUMENT will rise here in commemoration of past events and become a shrine to replace these more tangible but slowly disappearing mementos of an important phase of wireless telegraphic development.”

Years before the Cape Cod National Seashore in Massachusetts was dreamed of, this hope was expressed by Frederick W. Parsons of New York City, a retired telephone company employee and amateur radio “ham” with a deep interest in historical aspects of telegraph and radio communication.

For several years the seashore has been a reality, and its first historic shrine—the Marconi Station Area, which overlooks the North Atlantic from high, sandy bluffs near the village of Wellfleet—was opened in August, 1963.

Clad with cedar shingles, the shelter has already started to weather in the storms, salt air and sun of the seashore to the soft, gray color so typical of buildings along the New England coast. Within, there is a precise scale model of the original Marconi Telegraphic Station, built by Mr. Parsons and donated by him to the American public.

Guglielmo Marconi, pioneer of wireless telegraphy, came to Wellfleet in 1901 to build the station he hoped would send messages across the Atlantic. He erected twenty slim, single-pole towers supported by a network of guy wires; but before the station was operative a severe storm blew the towers down. Undaunted, he built four 210-foot heavy wooden towers, strongly cross-braced. Living quarters, message center, power-supply building and storage sheds were also built. The first message was successfully transmitted to England on January 18, 1903.

For fifteen years the station sent news to ships on the high seas at 10 p.m. and 2 a.m. daily, via a direct telegraph-line connection with the *New York Times*. Following the news, private messages were sent and received from ships at fifteen cents a word although, at first, only thirteen ships were equipped to transmit by telegraph.

World War I military censorship closed the station, and the invention of the radio tube outmoded the cumbersome and noisy “spark” machinery. With abandonment, nature took over. The buildings weathered away. The sea, eroding into the cliffs at the rate

of two to three feet a year, caused some of the structures and towers to fall into the ocean and be lost forever. Even today, Park Service officials admit they will eventually have to move the shelter on the grounds that “You can’t fight the ocean.”

As part of its conservation program, the National Park Service has planted native beachgrass over most of the area to hold down the drifting sand. Tall, tough and thick-rooted, it survives the hot summer sun, freezing winter gales, salt spray and sand-blasting.

There is a granite monument by the shelter, and within are several tablets explaining some of the historic significance of the site. Nearby are a few ruins marked by small plaques telling what once stood on each location.

The Park Service is preparing a brief tape-recorded talk about the Marconi Station which is to be installed in the shelter. Visitors will need only to press a button to hear this capsule history.

More than 760,000 persons visited the Cape Cod National Seashore in its first official season; of these, more than 12,000 viewed the historic Marconi Station Area. ■

A Family Approach to Regional Planning

By Dorothy Stanley Moore

“WHY, THAT’S WHAT WE’VE BEEN doing!” I thought, after reading proposals for regional approaches to combat the increasing congestion in our national parks.

A few years ago, our family spent a week in Rocky Mountain National Park. Feeling fortunate at finding a campsite at 9 p.m. and seeing the other packed campsites in the park, my husband said with feeling, “I’ll never camp in Rocky Mountain National Park again!”

Since the park is such an outstanding example of mountain scenery, this statement seemed too drastic. Last summer, wanting to see the mountains again, we looked at our map of Rocky Mountain National Park. We had an idea as to how we could see the mountains—this time with some privacy.

Step one in our private “personal approach” program was to write for a map of the Roosevelt National Forest, which borders the park on the north and west. We looked for campground symbols lying off the main through roads. Next, our request for specific information was quickly answered by the forest supervisor. Long Draw reservoir sounded like the answer to our needs; a primitive site, but one of the most attractive. Not only that; it was next to the far northwest corner of the park.

The road, in process of being improved, was in bad shape. We checked with a Forest Service ranger who informed us that his four-wheel-drive truck had been mired just the day before. But, being well prepared and equipped to camp anywhere, we drove in. Just beyond the last large mudhole was the campground. It had fire-grates, tables, and latrines. This hardly seemed primitive to us, but is the common designation for the protection of unprepared campers. Our water came from Long Draw Creek, roaring with irrigation water from the reservoir. In this handsome site our only camping neighbors were a retired railroad man and his wife—a very pleasant couple. The roar of the creek made conversation impossible beyond a few feet, contributing to the privacy of both families.

We shared an occasional cobbler, and they shared surplus fish.

Our family included daddy Ed, 12-year-old Joyce, Stan, nine-and-a-half years old, eight-year-old Glen and Sandy, our 14-month old toddler. Our hiking equipment included a commercial backpack babyseat in which Ed carried Sandy, and a small kiddy rucksack. The children took turns toting the rucksack, which held disposable diapers, lunch, and reference books.

Deer and Researchers

A daily occurrence was the sighting of deer, either on our hikes or near the campsite. Research was being carried on in the area; a wildlife expert was tagging deer, and had even put a transistor radio on one of these gentle creatures the day before we arrived. We saw elk tracks on our hikes, but only Ed, Joyce, and Stan actually saw an elk.

Nearly every morning, after breakfast cleanup, the family was off exploring. We selected our general route ahead of time from a U. S. Geological Survey topographical map.

Our first hike—a short one—took us to the dam over the trail eastward to Willow Creek. The high mountain meadows were filled with wildflowers. The children learned to tell a fleabane from an aster, but were most intrigued by the little red elephant flowers; each of the little flowers on their long stems looked like an elephant’s head. (Our reference sources were *Mountain Wild Flowers of Colorado* and *Colorado Wild Flowers*, both from the Denver Museum of Natural History).

Park rangers at Poudre Pass were friendly and helpful. They gave us information about the back-country, started our neighbor’s jeep one morning, and displayed a friendly interest in what we were doing. If we had intended to make camp in the park, they would have helped us select a back-country campsite. Our lunches required no firebuilding, but if circumstances demanded, they would have given us the required fire permit. I had not thought of it before, but it occurred to me that regional thinking is important

in a border station such as theirs.

One day we followed Willow Creek downstream to its junction with Long Draw. Later, we crossed a second ridge and followed the Cache La Poudre River to its junction with Long Draw. We soon found that deer knew the easiest way around the marshy meadows so we followed deer trails where no park trails existed. The only stream-crossing within miles was near the junction of the Cache and Long Draw. The crossing was a slender log, with a cable rigged above it for a handhold. It was nerve-racking to watch the children cross the turbulent, ice-cold creek below; but they insisted that, after the first try, the crossing was not bad at all.

We did not hike every day. We took time out so that Ed and Joyce could observe elk on Neota Mountain, while the boys built driftwood houses by the lake. Once Ed and Joyce back-packed over Thunder Pass to Michigan Lakes.

Our last hike was to Mirror Lake. The hike took all day; it should be attempted only by good hikers in good condition. Ed arrived at the end of the trail first, and chatted with some young men who commented on the difficulty of the hike. But when our three very young boys appeared, the men lapsed into immediate silence. With our week of hiking at ten thousand feet and above, we were all in good shape, but it *was* difficult.

End-of-the-road or back-country camping means getting along happily without running water and campfire programs, but we still had our park rangers and an interesting assortment of people with whom we spoke. We stayed a week and half at Long Draw. Our youngsters agreed it was the best vacation we ever had.

I think we proved that families can enjoy camping without tourist traffic if they will take the time to write a few letters and do a little research ahead of time. The reward is a true wilderness vacation, which many of us want but cannot find. A voluntary regional approach by interested families such as ours can help while over-all ideas are being developed. ■

News and Commentary

Oregon Dunes Seashore

There are at present several bills before Congress aimed at preserving one of the nation's most valuable—and perhaps most rare—natural areas: the unspoiled shorelines of rolling wave and sunbleached sand which are so rapidly disappearing under the bulldozer. Recently, upon invitation of the Senate Committee on Interior and Insular Affairs, the Assistant to the Association President, George H. Siehl, presented his views on S. 250, a bill to create an Oregon Dunes National Seashore.

There is no quarrel with the purpose of the bill: to preserve and protect the rugged Oregon Dunes for public education and enjoyment, Mr. Siehl stated: however, portions of the bill conflict with sound preserve management. One of these conflicts centers around "the absence of a set of standards . . . in the management of the proposed seashore." Such standards must be set down clearly to regulate possible commercial and industrial use. Acquisition of privately-owned areas could be managed through a system of protective covenants.

Federal control of Park Service lands such as the proposed seashore is vital to wise use and management of any such area, said Mr. Siehl, and S. 250 seems superior to a somewhat similar bill presently before a House subcommittee in that it grants the Secretary of the Interior authority to control water use in the area. It was noted in the statement that "It would be an act of legislative folly to promulgate a law leaving the Secretary defenseless to prevent another water supply disaster such as is now destroying the [Florida] Everglades."

A serious defect in the bill regarding Secretarial control turns around the problem of seasonal hunting in the area. Such activities, at best questionable in preserves set aside for all the people, cannot be left to chance, private whim, or even State law alone, Mr. Siehl said. Furthermore, these preserves must serve as true sanctuaries where wildlife and humans can meet free of fear of one another; this is obviously impossible where unrestricted or poorly managed hunting takes place. It was recommended that, with the advice of state and other officials, the Secretary of the Interior maintain final authority over hunting and fishing. It was also noted that some boundary revision seemed to be in order; that the southern tract of land from Tenmile Creek to Coos Bay ought to be

added to the proposed preserve. A similar statement on H.R. 7524, the House version of the bill, was submitted, upon invitation, for the record.

Glad Tidings for Prairie Dogs

We have good news for prairie dogs this month—some prairie dogs, at least. It seems that the final stand of the native black-footed ferret, which the Fish and Wildlife Service lists as both rare and endangered, is being made largely in South Dakota. But black-footed ferrets subsist principally on prairie dogs, which are being exterminated ("prairie dog control" is the final official term for the operation) by the State and the F & WS in favor of farmers and ranchers. The Service, in cooperation with the State, will examine prairie dog "towns" to be treated, and if any black-footed ferrets are found they will either be live-trapped and moved to a protected area—a national park, for example—or the prairie dog town will not be "treated" (more agreeable official term for exterminated). So the black-footed ferret will win either way.

The prairie dogs will, however, presumably have the choice of: (a) remaining to be exterminated; (b) remaining with the possibility of being eaten by a black-footed ferret; (c) remaining with the possibility of not being eaten by a black-footed ferret, or (d) moving out immediately. Prairie dogs making decisions (c) and (d) obviously will have longer life expectancies than those making (a) or (b); but it ought to be pointed out that decision (d) involves the risk of (1) meeting more black-footed ferrets, or (2) meeting more control agents. In any event, there is a mathematical probability that some prairie dogs will escape both the ferrets and the agents, which sounds to us like good news for some prairie dogs.

Of Men and Mountains

Not long ago a scientific attaché from the Australian embassy told the Association that he took a holiday and on the way drove from Washington, D. C. to New England, passing through the Shawangunk (pronounced Shongum) Mountains New Paltz, Ulster County, New York. As he drove, he became acquainted with the serene beauty of the area, and when he stopped for information he became equally acquainted with one of America's most pressing domestic problems: the preservation of rapidly-dis-

appearing natural scenic areas for recreational use.

The Shawagunk Mountains have for years been protected and cherished by the Smiley family, which owns the mountains, a gem-like lake, several facilities in the area, and a fine reputation for preservation of their land to protect scenic, scientific, and spiritual wilderness values. For a fee—used to keep the land in natural condition—the owners allow access to hikers, climbers, skiers, campers, nature enthusiasts, and other outdoorsmen. The mountains, their quiet forests, abundant and varied wildlife, beautiful flora, and a near-spiritual atmosphere have delighted citizens of nearby New Paltz, and all visitors, for generations.

Now, however, the mountains are being considered for other uses, not by the Smiley family and not by the knowledgeable public, but by the Federal government, which wants to "improve" the area by slicing the mountains in half with a "scenic" highway. Proponents of the highway carefully point out that plans should avoid scarring the beauty of the mountains; it is difficult to see how the highway itself can avoid being the chief scar. *New York Times* columnist Brooks Atkinson has written that the proposed highway "presents a classic example of a major national dilemma. Where is the dividing line between the public and the private interest?" In this case, one might well ask, "What is the public interest here?" Most conservationists would probably agree that we already have sufficient scenic highways lacing the nation's wilderness areas. On the other hand, the public needs these mountains, and comparable areas, for recreational use. The Shawangunk Mountains are irreplaceable. Let them stand unmarred.

Matter of Life or Death

The birth-control problem in India, which has virtually come to mean life or death for the nation's millions of overcrowded, underfed and undereducated people, is now receiving the strict attention of the Indian government. Recently American Ambassador to India Chester Bowles returned briefly from his post there to report, in a Senate subcommittee hearing on population, that the "apathy and foot dragging" of the Indian people on the subject has come to an end. The problem is so acute, reported Ambassador Bowles, that the Indian government is pushing an over-all birth reduction plan

and hopes to cut its population growth from the present year's 2.4 percent to one percent in the next decade. By 1966, if the plan works, India will have 100,000 family-planning workers in the field, and a network of 5000 health centers throughout the nation. It is even now requiring all doctors to spend one or more years on family-planning work in the Indian villages before beginning private practice. It is the traditional-minded villagers, knowing nothing about birth control, who must be reached with sound information and devices for family planning if the program is to succeed.

The Indian government is apparently determined to make the birth control program a success, and thus provide housing, clothing, education, medical care, and a more pleasing home environment for its people. If the United States receives a call for help from India concerning the program, reported Mr. Bowles, it will receive "a maximum amount of aid."

Wilderness Waterway "Problems"

Widespread sentiment in Montana for the National Park Service's Lewis and Clark National Wilderness Waterways and against further unnecessary damming of the river and its tributaries in the State has furnished the two big Federal dam-building agencies with considerably more than token resistance. In fact, the rebellious attitude of some Montanans toward further damming of the Missouri has created what a regional Bureau of Reclamation spokesman has referred to as "problems we have in Montana."

The Corps of Engineers, prospective builders of the Cow Island dam above Fort Peck reservoir (which would inundate the Missouri's course between the reservoir and Fort Benton, eliminating the Wilderness Waterway plan) also has "problems." Chief among these at the moment is the insurgent position taken by the Montana Fish and Game Commission, which not long ago declared the reach of the river between Great Falls (some forty river miles west of Fort Benton) and the Fort Peck reservoir a state historical and wild waterways area. The commission's declaration fell like a thousand-pound bomb among the State's "growth and development" fraternity, which supports the Corps' high dam at Cow Island. Some sample comment: "It is about time the Fish and Game Commission be put in its proper place . . .", and the Commission "is getting too big for its breeches . . ." And again, the "growth and development of central Montana will be sorely impeded . . ." and the Commissioners ought to reverse their action or "separate them-

selves from their appointed offices," and so on.

However, preservation for the Missouri between Fort Peck reservoir and Fort Benton has support in Montana beyond that of the doughty Commission. Among organizations that favor a free-flowing river are the Montana Wildlife Federation, and another important State group, the Montana Stockgrowers' Association. The *Billings Gazette* has stated editorially that: "If Federal aid is to have a hand in future developments along that section of the stream [between Fort Peck reservoir and Fort Benton], our best hope lies with the agency most interested in what will safeguard the big and growing tourist and recreation industry of the State. If an inter-agency tug-of-war develops, Montana should support the Park Service."

Perhaps A. B. Guthrie, widely known author, summed up the feeling of many Montanans, as well as those of many conservationists and lay persons elsewhere in the nation, when he recently remarked of the Fort Peck-Fort Benton reach of the river: "There's history in that country and there's beauty unsurpassed anywhere else in the world, but they're not going to be there much longer if the Army Engineers have their way."

Magazine readers who think that the Montana Fish and Game Commissioners deserve congratulations and support in a decision which was obviously not an easy one may write Commission Chairman W. E. Staves, at Polson, Montana.

Redwood Park & Freeway

Plans for a freeway through Jedediah Smith Redwoods State Park in northern California have been moved ahead so that initial work will begin this summer. Money to purchase rights of way should be available before the end of the summer, the Sierra Club reports from San Francisco, adding that the timetable on this controversial project "has been drastically speeded up to confront conservationists with an accomplished fact before an aroused public opinion stops the California Division of Highways." The club said that the Division of Highways

had earlier assured the public that construction would probably not occur for 8 or 10 years. As late as March of this year, the prediction was that nothing would be done in the state park until 1970.

However, in a letter to the club from Director of Public Works John Erreca, which was recently released, the Division revealed that \$150,000 for right-of-way purchase is in the 1965-66 state budget, which went into effect July 1. Subsequent approval by the Highway Commission at an August meeting should free the money for use thereafter. The letter said that actual construction money will be requested in the budget for the following year, so that construction could begin in the summer of 1966.

Conservation groups have opposed routing the freeway through the park. They say that a feasible alternative route for a freeway exists just one and a half miles to the north outside the state park. They further point out that many of the great redwood stands of Jedediah Smith were purchased by donations from people all over the country to be protected forever, and that the State cannot justify invasion of the park by a freeway.

Concerning the Saguaro

The Magazine has received considerable comment on the article published in the June issue in which Drs. W. A. Niering and R. H. Whittaker examined the ecology of the saguaro in southwestern national monuments and the probable reasons for the poor reproduction and condition of the plant in certain monuments.

One such letter was received from Mr. Richard H. Pough, president of the Natural Area Council, New York City advisors on land preservation; it is printed below.

"During the period when I was obtaining material in the Saguaro National Monument for the construction of a diorama in my Hall on the Forests of North America at the American Museum [of Natural History, in New York City] it was quite apparent that the saguaros were not reproducing. I suspected grazing, and the article in the June issue by Niering and Whittaker pinpoints the probable reasons.

"As the presence of cattle and horses in both the Saguaro National Monument and Organ Pipe National Monument seems so out of place in units of the National Park Service, I looked into what could be done about it.

"As the chances of the National Park Service obtaining the necessary funds from Congress are practically zero, the solution appears to lie in having some

Your Views Are Needed

Association members wishing to urge the alternative freeway route to the north of Jedediah Smith Redwoods Park may write to Governor Edmund G. Brown at the State House, Sacramento, California, or John Erreca, State Director of Public Works, Sacramento.

'friend' of the National Park Service buy out the cattle operators. Where more was involved than the national monument grazing it could be subsequently put on the market minus the national monument grazing rights.

"I was told that cattle operations in the area are far from being so fabulously profitable that the price would be unreasonable. On the contrary, I was assured that a modest sum would probably buy out all the ranches involved."

Saving the Nene

Sneaking up on mother birds, pouncing on their nests, and stealing their eggs is not a profession which meets with widespread approval in this country. But wildlife experts in Hawaii carry out the job with gusto, claiming that this procedure

is necessary to save Hawaii's state bird, the nene, from possible extinction.

The nene (pronounced nay-nay) is a large goose that once graced the slopes of Hawaiian volcanoes. The brown-grey birds, which sport striking black feathers on their heads and necks, are about 20 inches tall. Their size does not, however, preclude them from being strong flyers; one female flew across 26 miles of open water to return to her favorite island after having been "transplanted" by conservationists. The birds were plentiful in Hawaii until habitat destruction, introduced predators, and overhunting reduced the nene population so severely that the territorial legislature of Hawaii finally voted to finance conservation measures for the birds. In 1958 the Federal government contributed additional funds for a "save the nene" project.

The project consists of gently removing the nene's first clutch of three to five eggs. The eggs are hatched by specially-trained bantam chickens. The sight of her empty nest spurs the nene to lay a second clutch; the process is repeated and bantams again adopt the kidnapped eggs. The nene, however, does not give up; she lays a third clutch, which she is permitted to hatch herself. According to one official of the Hawaiian State Game and Fish Department, the project has successfully raised the nene population from about 36 to its present level of some 300.

Guadalupe Mountains Park

During the past several years the proposed Guadalupe Mountains National Park in trans-Pecos Texas, only a few miles southwest of Carlsbad Caverns National Park in southeastern New Mexico, has been widely discussed and studied by conservationists and planners in the National Park Service. In both the 88th and 89th Congresses there have been bills to create the park, and during mid-July of this year Washington public hearings were held on the subject by the House Interior and Insular Affairs Committee's Subcommittee on National Parks and Recreation. On invitation of the Committee, Paul M. Tilden, editor of *National Parks Magazine* and assistant to President Anthony Wayne Smith of the National Parks Association, presented his views concerning *H.R. 517* and *H.R. 698*, identical bills to establish the park.

Tilden indicated that the Association has closely followed the park proposal, and has reported upon it from time to time in the Magazine; and that the Association is satisfied that the scenic and scientific features of the area to be included in the park are of great national significance. He termed the pattern of land-use which has been followed in past

years by J. C. Hunter, Jr., owner of the greater part of the mountain terrain that would be acquired for the 72,000-acre park, as particularly enlightened. He pointed out that the terrain, which is an ecologically fragile one, is presently in excellent and largely natural condition and suggested that the park, if authorized, ought to be developed with a careful eye to its delicate nature. Tilden further suggested that some provision ought to be made for closing out mining rights in the park within a specified period of time, which he thought might well be five years from establishment, or ten years at most.

Wildlife Research Center

As the American human population pushes relentlessly upward, some of the nation's wildlife populations—pressed for space, denied natural sources of food and water, and harassed by hunters and collectors—decline with alarming rapidity. Special committees under the Department of the Interior have compiled long lists of endangered birds, mammals, reptiles, and others; these species are doomed to extinction unless State and Federal agencies are able to reverse the trend.

John S. Gottschalk, director of the Bureau of Sport Fisheries and Wildlife, declared recently that scientific study of endangered species and their needs is essential to save many animals; at a hearing of a Senate subcommittee on appropriations for the 1966 fiscal year, Gottschalk told the subcommittee that research on endangered animals could be favorably carried out at a proposed site within the Patuxent Wildlife Research Center, located on a tract of greenery between Washington, D. C., and Baltimore, Maryland. Mr. Gottschalk outlined the activities of the proposed center as including propagation and release of endangered species; studies of food and habitat needs of the animals; and field studies to find suitable release sites for "captive-reared" animals.

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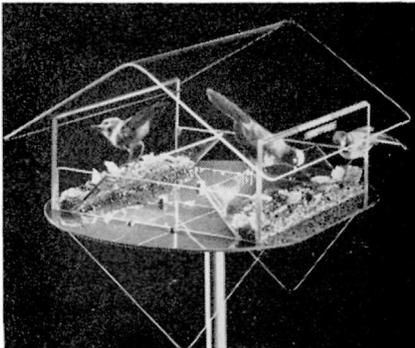


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Review

THE LIVES OF DESERT ANIMALS IN JOSHUA TREE NATIONAL MONUMENT. By Alden H. Miller and Robert C. Stebbins, with illustrations by Gene M. Cristman. University of California Press, Berkeley, California. 452 pages. Clothbound, \$10.00.

For many of us who believe that our lives increase proportionately to the knowledge and understanding we gain of the natural world, our national parks and monuments are often the only classrooms in which we have an opportunity for study. It is always a great advantage, moreover, to be provided with a really satisfactory book to guide us toward the knowledge we seek. *The Lives of Desert Animals in Joshua Tree National Monument* is such a book. It offers a survey of desert life with a wealth of scientific detail, and is written in a competent style readily comprehensible by the intelligent layman.

Joshua Tree National Monument lies at the junction of the Mohave and Colorado Deserts and the eastward-trending spurs of the California coastal mountains. It includes flora and fauna of all three regions. One of the most fascinating aspects of this study deals with the overlapping levels of these differing habitats within the monument, and the intricate interrelationships of the animals and plants of each level.

Much of the book is a catalogue of the fauna of the monument. The 249 species of vertebrates living there are fully described; their range, and statistics as to their occurrence in the monument is given. A commentary on the particular characteristics and habits of each species is perhaps the most interesting feature of this section of the book.

The authors, however, have not been content with producing a mere field-guide to the regional fauna. Alden H. Miller and Robert C. Stebbins, both professors of zoology at the University of California at Berkeley, and connected with the Museum of Vertebrate Zoology there, have given us—in this one volume—the results of fifteen years of intensive study of the area. A long introductory section, replete with fine maps, tables, and diagrams, provides an insight into their methods of study, and an interpretation of their findings. It takes up the complexities of the adaptations of animals to specific habitats within the desert, and describes the regional ecology in detail.

The book's illustrations were planned by Gene M. Cristman, who also contributed a large and varied selection of

drawings in black and white, and in watercolor. Many of the fine photographs, taken especially for the elucidation of the text, are also Mr. Cristman's work.

The University of California Press is to be commended highly for the quality of printing and binding that makes *The Lives of Desert Animals in Joshua Tree National Monument* such a readable book. From an attractive dust jacket to the fine reproduction of both photographs and paintings, this book is appealing to the eye. A binding which allows the book to open flat at any page will prove indispensable to those of us who intend to thumb through its pages many times in years to come.

Eleanor Gamer

THE CONSERVATION DOCKET

A bill to protect endangered species of native American animals has been introduced by Washington Senator Magnuson, and referred to the Senate Commerce Committee. The bill, S. 2217, is identical to bills introduced earlier in the House by the late Representative Thompson, and Maryland Representative Garmatz. Hearings on July 15 were scheduled for the bills, which were referred to the House Subcommittee on Fisheries and Wildlife Conservation.

Another bill aimed at the protection of America's wildlife, Representative Dingell's H.R. 4157, is directed toward wiser use of pesticides to protect wildlife. The bill would authorize Congress to appropriate large sums for research into pesticides and their effect on wildlife; it would also instruct the Department of Agriculture to label chemical pesticides in a way that would warn users of their potential danger to all forms of wildlife.

Alaska's Representative Rivers, acting to protect and conserve the valuable North Pacific fur seal, has introduced H.R. 9602. The bill would be known as the "Fur Seal Act of 1965," calling for administration of the Pribilof Islands to protect the seals and other wildlife. The bill is in the House Committee on Merchant Marine and Fisheries. Two other House bills, H.R. 9743 by Resnick of New York, and H.R. 9750 by Pepper of Florida, have been introduced to authorize the Secretary of Agriculture to regulate transportation, sale, and treatment of dogs and cats intended for research and experimentation. Both bills are in the House Committee on Interstate and Foreign Commerce.

The proposed Assateague Island National Seashore, long in controversy between developers and conservationists, received hearings in the Subcommittee on National Parks and Recreation of the House Committee on Interior and Insular Affairs during late July. One version of the proposed preserve, outlined in S. 20 introduced by Maryland's Senator Brewster, would allow construction of a through highway in the preserve. This bill passed the Senate; Interior Secretary Udall, who originally opposed the road on

the grounds that it would disturb the island's delicate ecological balance, now seems to favor such a road. A bill which would eliminate the road, Representative Sickles' H.R. 1730, is under discussion in the House Subcommittee; property owners on the island, Interior officials, and conservationists presented their views on H.R. 1730 at public hearings in July.

S. 21, introduced by Senator Anderson of New Mexico to coordinate the wise use and management of the nation's water resources and related land resources, has been favorably reported out of the House Committee on Interior and Insular Affairs. It was recently passed in the House by voice vote, and was signed into law by President Johnson on July 22. The measure will be known as the Water Resources Planning Act, and will give the Federal Government greater leeway in planning water resources use and keeping the President and Congress informed on the water needs of the nation.

Representative Daniels of New Jersey has introduced H.R. 9578, to establish a Hudson National Scenic Riverway in the States of New York and New Jersey. The bill, which comes at a time when the question of proper preservation and development of the Hudson shoreline is very active, was referred to the House Committee on Interior and Insular Affairs. The committees' National Parks and Recreation Subcommittee recently held field hearings on Rep. Ottinger's H.R. 3012, and several rather similar bills, which would create a National Scenic Riverway on the Hudson.

Senator Maurine Neuberger has introduced S. 2259, to control outdoor advertising along federal-aid highways. The intent of the measure is to keep billboards and other so-called offensive advertising from marring the scenery of highways, causing accidents and dampening the recreational value of public travel, especially by automobile.

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National Park Service photograph

Guadalupe Peak, highest point in Texas at 8751 feet and one of the outstanding scenic features of the proposed Guadalupe Mountains National Park, as seen from the summit of the Pine Spring Canyon trail.

ONE OF THE IMPORTANT EDUCATIONAL FUNCTIONS of the National Parks Association is the impartial evaluation of proposals for national preservations like Guadalupe Mountains National Park in Texas, and the dissemination of information concerning such proposals. Thus, in this issue of the Magazine, we present a general article dealing with the scenic and scientific qualities of the proposed Guadalupe Mountains Park, and the general plan of development seen for it by the National Park Service.

YOU CAN ASSIST YOUR ASSOCIATION in this educational work in any of several ways: by helping to secure new members; by raising your membership class; by contributing to the general funds of the Association over and above regular dues; or by making provision for the Association in your will. All gifts and bequests are deductible for Federal income, gift and estate tax purposes.

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