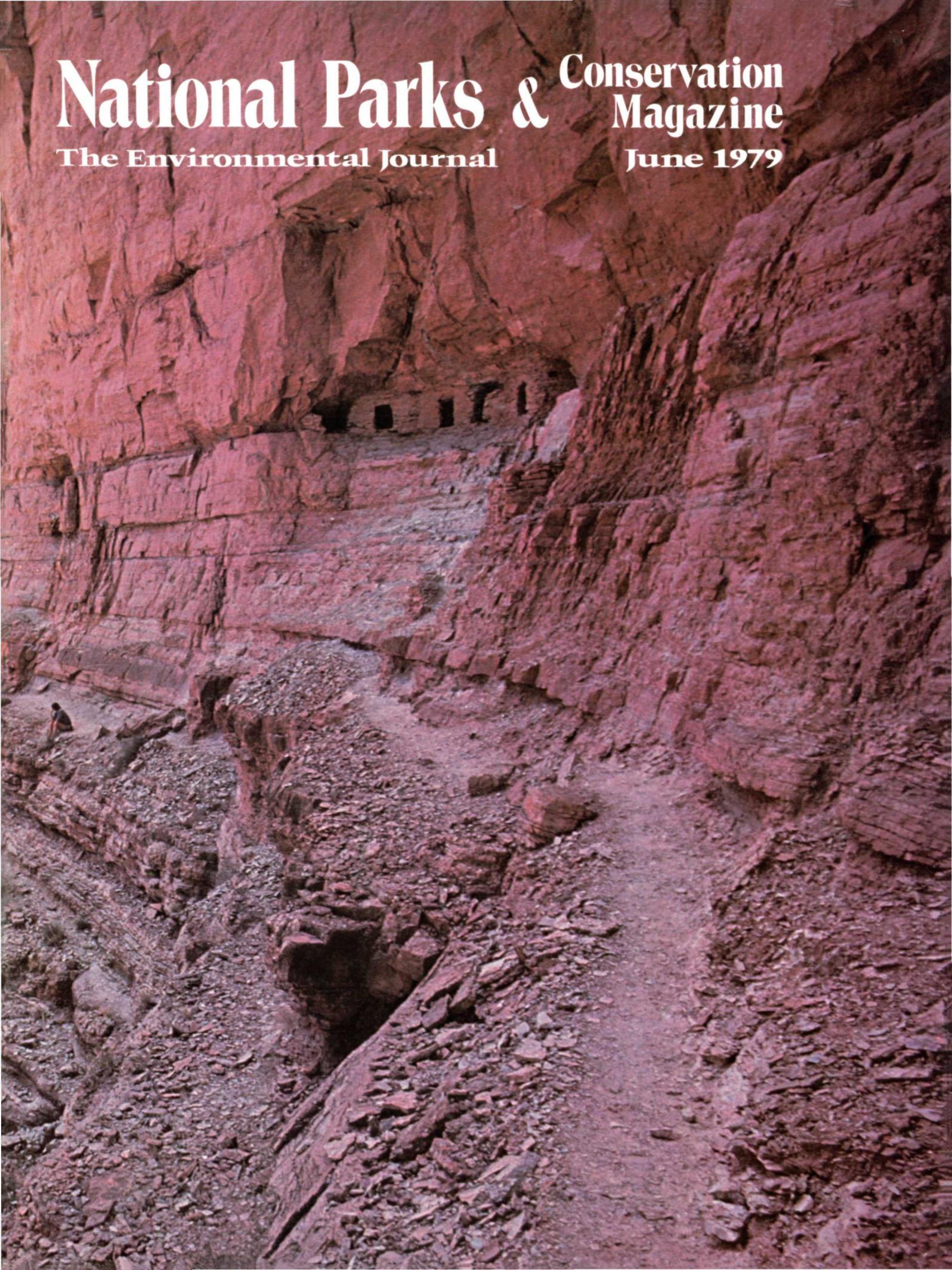


National Parks & Conservation Magazine

The Environmental Journal

June 1979



Dead End for Nuclear Power

NEITHER panic nor hysteria, but hard, cold anger, unrelenting and sustained, should be the public response to the Three Mile Island nuclear incident.

That anger should force an immediate shift in public and corporate policy away from nuclear energy toward the readily available and completely adequate known alternatives.

The episode has revealed appalling incompetence and irresponsibility among the business and governmental officials involved.

The faith of many people in the moral and intellectual integrity of scientists and technicians, already weakened, has been further shaken.

THE EXTENT of possible contamination of air, water, and soil from such an accident, with the danger that entire regions may be rendered uninhabitable for thousands of years, has been clearly revealed.

The risk that supposedly normal and harmless emissions of radioactive materials by air and water may escalate rapidly into lethal pollution is now broadly understood.

And the well-considered decision taken by South Carolina to reject the dumping of radioactive materials within its boundaries makes the point once again that the problem of storing long-lived radioactive wastes has not been solved, and may well never be solved.

We are dealing here with wastes with a half-life of 24,000 years, the complete radioactive decay of which will take one million years. These time scales reach beyond the imagination of man, and certainly beyond the life of any existing or possible human institutions.

We have learned at the same time the scope of governmental deception and secrecy in respect to atmospheric and soil pollution by the above-ground and below-ground hydrogen bomb tests in Nevada.

INVOLVED are perils of poor theory, bad design, faulty installation, shoddy construction, sloppy maintenance, incompetent operation, ignorance, carelessness, pure accident, and the avarice which can lead to putting a plant into service before it is ready.

Any of a long series of elements in the Three Mile Island episode could have initiated the chain reaction of breakdown. The notion that human

ingenuity can construct a fool-proof mechanical system of any kind is ridiculous. These risks, from a responsible governmental and business point of view, are simply unacceptable.

Three Mile Island showed clearly enough what a complete meltdown would mean. Do not suppose that we can save ourselves by putting these plants underground, nor by siting them in the wilderness. Wherever they go, like their radioactive products, they will be centers of death and destruction.

There is no way out of the nuclear impasse. Nuclear power is at a dead end. Survival requires that we turn immediately to the alternative energy sources which are fortunately readily available.

THE FIRST of these alternatives is solar energy in the narrow sense of the word. We have contended in these pages for some time that the key is the photovoltaic cell, which generates electric current directly from sunlight without fuel and without wastes.

The problem has been the expense; getting costs down depended on mass production; mass production required a mass market; mass markets depended on low prices and low costs of production. The obvious answer all along was to offer a large governmental market.

Beginning with minimal staffing, the Task Force on Solar Energy Commercialization of the Federal Energy Administration produced several reports some time ago on the practicality of solar energy systems, including the photovoltaic cell. It looked not so much at the devices but at the market and concluded that the latter could be accorded by Defense Department purchases of generating equipment for use in remote locations. Once the beginnings of an adequate demand had been created in that fashion, the market would expand geometrically and mass production would bring the cost of equipment down.

THERE WAS interest in Congress, but the Administration opposed the approach; a limited program was launched pursuant to the National Energy Act of 1978. This program should be expanded rapidly; the Administration should change course and press with determination to get mass markets and mass production for the photovoltaic cell.

Continued on page 31



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COVER *Anasazi Granaries, Grand Canyon, by John Richardson Throughout the Grand Canyon—along the Colorado River and in side canyons, in the depths of the Inner Gorge, on the plateaus, in the cliffs—are evidences of people who not only visited the canyon to hunt and forage but lived and thrived there. Information about how these people adapted to this apparently hostile environment will be lost, however, unless the canyon's archeological sites can be better protected or professional test excavations can be made at selected sites. (See page 4.)*

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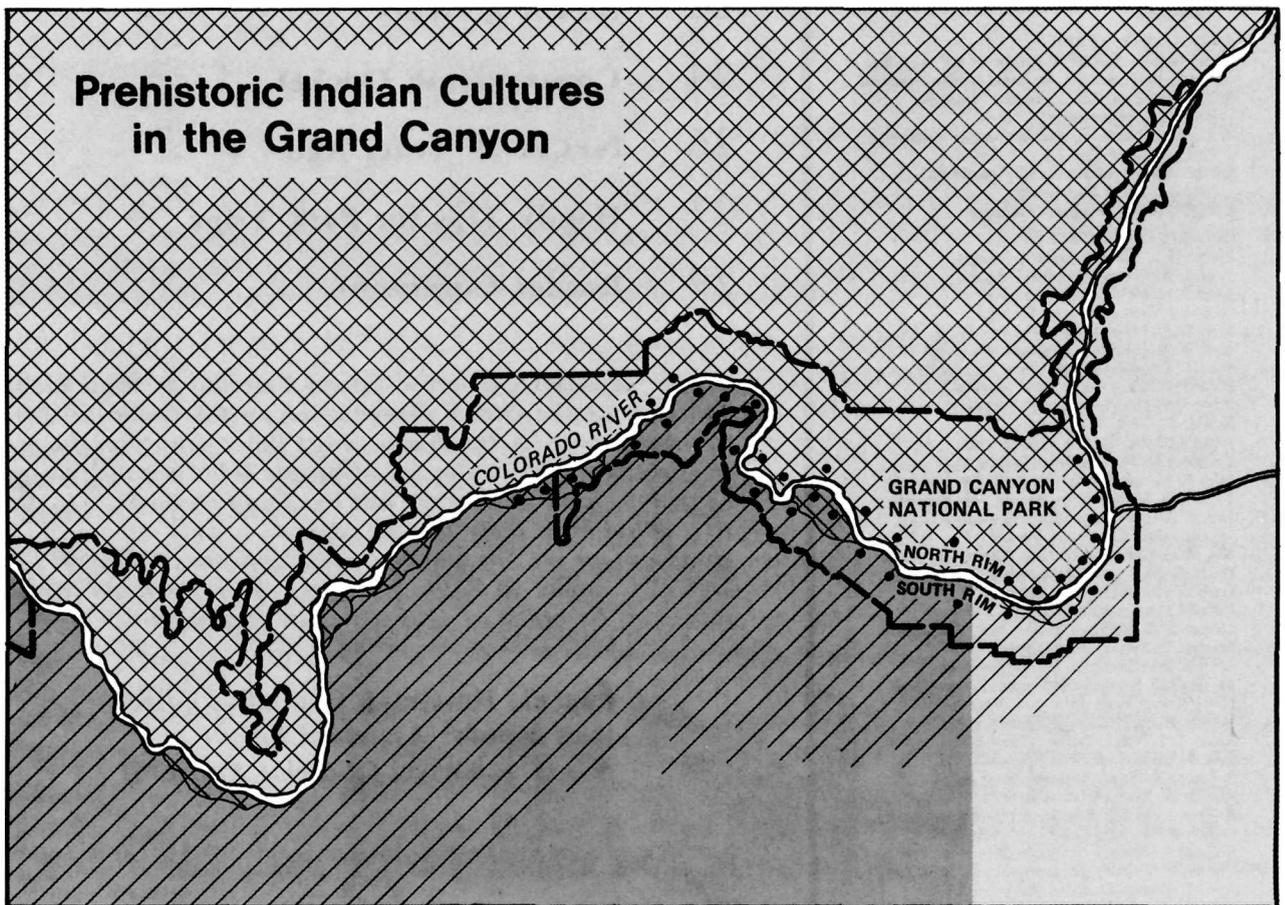
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The Grand Canyon is as rich in cultural resources as it is in scenic beauty and geologic wonders—but these treasures are in danger of being lost forever

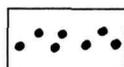
by ROBERT C. EULER

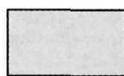
IN SEARCH OF THE ANCIENT ONES

Preserving the Cultural Resources of the Grand Canyon



JAMES F. O'BRIEN

 FIGURINE MAKERS
2000 – 1000 BC

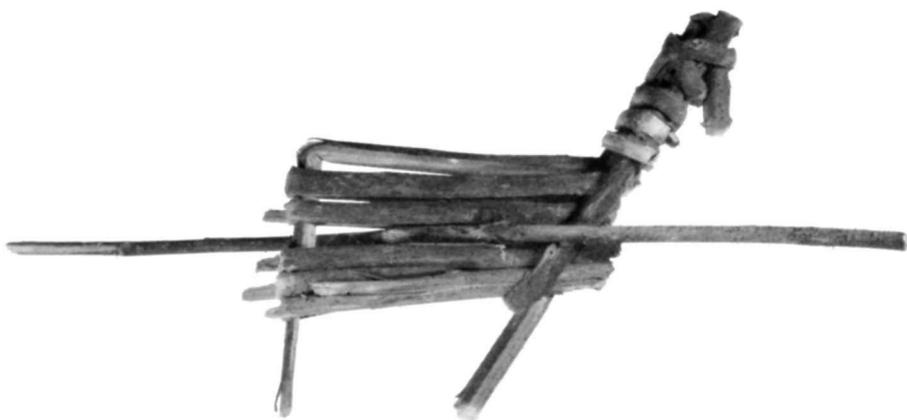
 ANASAZI TRIBES
(Ancestors of Hopi)
500 – 1150 AD

 COHONINA TRIBES
700 – 1150 AD

 Boundary of GRAND
CANYON NATIONAL PARK

 PAIUTE TRIBES
(Ancestors of Southern Paiute)
From 1300 AD

 PAI TRIBES
(Ancestors of Hualapai & Havasupi)
From 1300 AD



Looking at the awesome spectacle of the Grand Canyon, most visitors do not realize that the canyon contains many evidences of the presence of man. Some four thousand years ago mysterious hunters left twig figurines (left) in caves in the canyon walls; who left them, and their purpose, is still unknown. Later, the Anasazi lived in the canyon in hundreds of small villages, leaving behind them many structures such as the granary below. Still later, Hopi Indians made forays into the canyon from their villages to the east to gather salt (below, bottom).

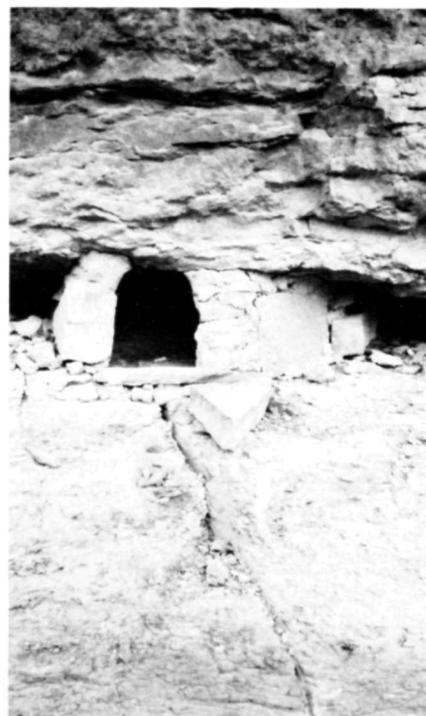
AS I WRITE these words, I am sitting by an open fire in a cabin on the North Rim of the Grand Canyon. It is February and with six feet of snow on the ground, it is still snowing hard. We are isolated—except for telephone and radio—from the rest of the world. I am here to experience the harshness of winter at this elevation of eight thousand feet amid pine and aspen forests, to try to imagine whether Indians could have lived here at this season in bygone days. For more than twenty years I have been engaged in an effort to understand the human ecology of the Grand Canyon—the adaptation of humans, not unlike ourselves, to this startling region.

THAT EFFORT has taken me back in time to about 1000 to 2000 B.C. and the earliest human inhabitants of the canyon. These people were hunters who used caves in the Redwall Limestone cliffs as shrines. In these shrines they placed ingeniously made split-twig figurines of animals—probably images of the game they were hunting. Often these figures were pierced by sticks, probably representing spears. In spite of extensive exploration and excavation, archaeologists still do not know the identity of the figurine makers. However, spear points of the same age as the images that are associated with the Pinto Basin

culture of the Mohave desert in California have been found on and near the South Rim of Grand Canyon. This discovery suggests that these Indians may have made the figurines.

From that time three thousand years ago until shortly after the beginning of the Christian era, there is no evidence that any people lived in the Canyon. Then, apparently some time around 500 A.D., the Anasazi Indians, ancestors of the present day Hopi, began to explore the Canyon's recesses. From the remains these people—whose name means "Ancient Ones" in the Navajo language—left behind, we can tell that they grew crops of corn, beans, and squash. They also hunted deer, desert bighorn sheep, and smaller animals; and they gathered a great variety of edible wild plants. Evidently they found the varied environment of the canyon to their liking, for they settled there in hundreds of small villages, reaching their maximum population between 1000 and 1150 A.D.

Sometime during the same period—from about 700 to 1150 A.D.—another group of native Americans, the Cohonina, settled along the South Rim of the canyon. As neighbors to the Anasazi, the Cohonina seem to have developed a similar subsistence economy, and they emulated the architecture and ceramics of the Anasazi as well.

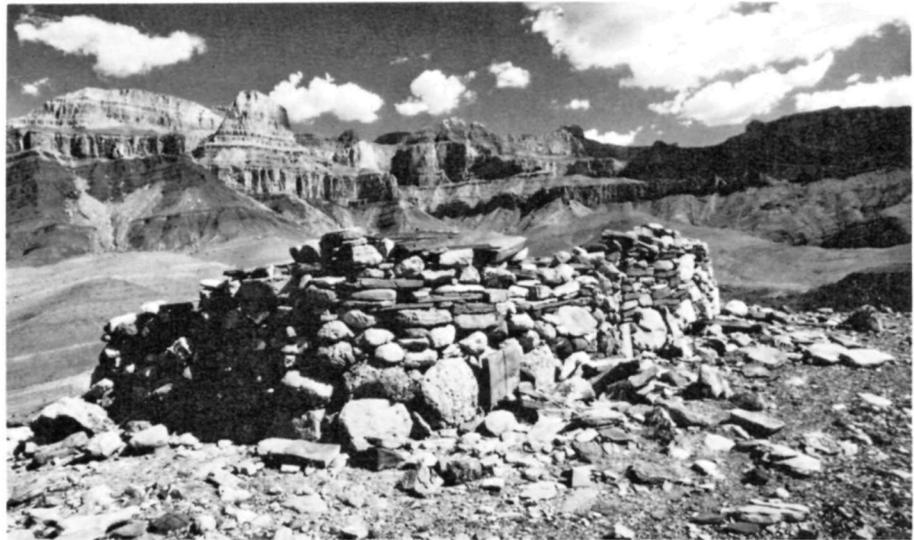


GRANARY, BY JOHN RICHARDSON



ANCIENT HOPi SALT MINE, BY JOHN RICHARDSON

Anasazis left the primitive stone shelter at right and the granaries below in remote areas of the Grand Canyon. Ancestors of the Hopi Indians, this group of people lived, hunted, foraged, and farmed in the canyon from about 500 to 1150 A.D.



HILLTOP RUIN, BY JOHN RICHARDSON

ANASAZI GRANARIES, BY JOHN RICHARDSON



Then, around 1150 A.D., or slightly earlier, our evidence shows that severe and prolonged drought conditions prevailed in the canyon as well as elsewhere in the northern Southwest. Neither the Cohonina nor the Anasazi could sustain themselves in this arid climate, and both groups abandoned the region. The Anasazi moved some miles to the east, where their descendants—the Hopi—continue to live. The question of where the Cohonina went continues to puzzle archaeologists.

FOR MORE THAN a century and a half the Grand Canyon was once again empty of humans. About 1300 A.D., however, climatic conditions improved, and settlers began to move to the canyon rims and depths. From the northwest, out of the Great Basin of Utah and Nevada, came the ancestors of the Southern Paiute Indians to settle the North Rim. From the southwest, along the lower Colorado River, the Pai Indians—direct predecessors of the present Hualapai and Havasupai—moved to the South Rim of the canyon.

Although archaeologists can distinguish the remains of the Southern Paiute culture from that of the Pai—each group made different types of pottery and arrow points—their adaptations to the canyon environment were similar.

Both tribes engaged in limited farming but more intensively pursued wild game animals and gathered edible plants. They ranged over millions of acres on both rims of the canyon as well as in its inner reaches. Here they lived undisturbed and in harmony with nature for hundreds of years—until the coming of the white man in the nineteenth century. Then the end of the ancient ways came swiftly. By the 1880s the Paiute, the Hualapai, and the Havasupai had been defeated in battle by white soldiers and placed on reservations, their aboriginal lifestyle at an end forever.



JOHN RICHARDSON, 1978

Park Service archaeologist Trinkle Jones examines the midden of an archaeological site in the western portion of the Grand Canyon that has been dug into illegally. Unless test excavations are conducted, the information such sites contain about the people who lived there could be lost to vandalism.



ROBERT C. EULER, 1960



JOHN RICHARDSON, 1978

Sometime between 1960 and 1978, when these photographs were taken, unthinking river runners completely destroyed an eight-hundred-year-old Indian skeleton, rendering impossible any archaeological study of the remains.

EVIDENCES of Indian occupation in the Grand Canyon remained undisturbed and indeed mostly unseen for many years. Major John Wesley Powell, on his first trip down the Colorado River through the canyon in 1869, recorded a few ruins; but it wasn't until well into the twentieth century that archaeologists began to systematically record the canyon's cultural resources and to attempt to understand the culture and behavior of these people who had left no written records behind them.

One of the principal things that archaeologists have learned about these canyon dwellers, in addition to a fairly clear picture of their cultural history, is that the Indians, unlike the whites who came after them, made finely tuned adaptations to the environmental variations from the canyon rims to the river below. It is also clear that the rugged canyon walls were no obstacle to their movements. They traveled on foot—at that time their only domesticated animals were the dog and the turkey—from rim to rim of the canyon and throughout the myriad side canyons. So far, more than two thousand of their habitations and nearly one hundred of their access trails to the inner canyon have been discovered.

UNFORTUNATELY, there is a basic dichotomy in park management and interpretation; namely, in natural and scenic parks emphasis is placed on natural and scenic attributes, with cultural resources largely ignored, whereas in archaeological and historical parks natural resources tend to be overlooked. This dichotomy is false. So-called natural areas often were occupied by human groups, and archaeological areas contain natural resources as important to understanding the human population as artifacts are.

From the desert habitat of the Inner Gorge to the cool ponderosa pine forest a mile above on the North Rim, the Grand Canyon is rich in biological resources as well as in scenic splendor and geologic information. With all its biologic, geologic, and physiographic resources, the canyon provides a unique opportunity for studying how its past inhabitants lived in harmony with nature.

But today much irreplaceable evidence of these remarkable people is being destroyed—some through the sheer impact of thousands of hikers in the canyon backcountry and of river runners; others as a result of deliberate and wanton vandalism. Gates and

fences placed across the mouths of the figurine caves are being cut down; hordes of people are clamoring over masonry walls of the Anasazi sites; human burial sites are being desecrated; artifacts that have lain undisturbed for hundreds of years are being carried away for souvenirs or moved from their original locations; and indiscriminate and illegal digging is steadily increasing. Archaeologists are unable to study the information an archaeological site contains if it is disturbed in any way.

By law, the National Park Service is charged with the protection and preservation of these sites just as it is with the protection of the natural resources of the canyon. With more than a million acres to be cared for, however, Grand Canyon National Park is both understaffed and underfunded, especially in its resource management division. Because of this, it is virtually impossible to provide adequate protection for all the canyon's resources.

The Park Service could carry on certain resource protection programs, however, in spite of the shortage of staff and funds. Many of the three million people who visit the Grand Canyon each year, to be awed by its scenic and geo-



ROBERT C. EULER, 1963



JOHN RICHARDSON, 1978

Since 1963, when the author photographed the site, campers along the Colorado River in the Grand Canyon have thoughtlessly desecrated the grave of one of Robert Stanton's boatmen who drowned in the canyon in 1889.

logic splendor, are amazed to learn that other human beings have preceded them by almost four thousand years. They are even more astonished to learn that some eight hundred years ago thousands of American Indians, ancestors of some now living in northern Arizona, actually lived in the canyon—if not, as I learned by experience, on the North Rim during the winter.

Because many of these visitors don't know that such cultural resources as the remains of ancient Indian civilizations are protected by law, and are unaware of the importance of preserving archaeological sites intact, it is vital that interpretive programs designed to educate park visitors about the value of these resources be developed. Conceivably, such educational programs could be fitted into the existing park budget, but additional funding will certainly be required for the scientific study of these important archaeological sites.

First, a complete inventory of the cultural resources of the canyon should be conducted. In spite of the fact that the Park Service, like all other federal agencies, is required by law to inventory its resources, nearly 500,000 acres within Grand

Canyon National Park have never been explored by archaeologists; even partial funding for such research has not been available.

Then, if damage to the park's cultural resources—whether from human impact or natural erosion—becomes unavoidable, and archaeological remains are thus in danger either of losing their significance or even of being totally destroyed, the Park Service must find some way of funding professionally controlled test excavations to preserve information that would otherwise be irretrievably lost.

By such means, the Park Service would at once fulfill its legal obligations, serve the cause of scientific archaeology, and enhance public understanding and enjoyment of the Grand Canyon. And the canyon itself—that supreme scenic area—would continue to serve as an unrivaled textbook of geological, biological, and human history, as it has for so long. ■

Research anthropologist at Grand Canyon National Park, Dr. Robert C. Euler has conducted for the past twenty years archaeological reconnaissance in and around the Grand Canyon, as well as studies of the contemporary native Americans who live there now.

Message to Members

Help Save Cultural Resources

NPCA members who are concerned about not only the cultural resources of the Grand Canyon but those of other national parks as well can write to their elected representatives in Congress to urge provision of an adequate budget for the National Park Service so that funds will be available for thorough inventories of archaeological sites and for protection of threatened sites throughout the National Park System. Write also to the Chairman, House Interior Appropriations Subcommittee, B-308 Rayburn HOB, Washington, DC 20515, and the Chairman, Senate Interior Appropriations Subcommittee, 1116 Dirksen SOB, Washington, DC 20510.

In addition, urge your congressmen and senators to support pending legislation designed to protect archaeological sites on all federal lands. This legislation, introduced in the House as HR 1825 by Rep. Morris Udall (D-Ariz.) and in the Senate as S 480 by Sen. Pete Domenici (R-N. Mex.), will establish a permit system for archaeological research on public lands, set up procedures for the issuance of such permits, and impose civil and criminal penalties on individuals who, without permits, in any way damage, destroy, or remove artifacts found on public lands.

Severely depleted by overhunting
through much of its range,
the Atlantic walrus will need
both time and protection
to make a comeback

by RANDALL R. REEVES

The Atlantic Walrus in Retreat

AT FIRST GLANCE the walrus is not an endearing animal. Its eyes are always bloodshot, giving it an enraged, or at best intoxicated, appearance. Its bristly upper lip and pug snout are reminiscent of the angry bulldog that bites the mailman. And those ridiculous tusks—they make nuzzling seem unthinkable. Its tough, wrinkled, warty hide, constant bellowing, and remarkable stench combine to make the walrus a most *resistible* creature.

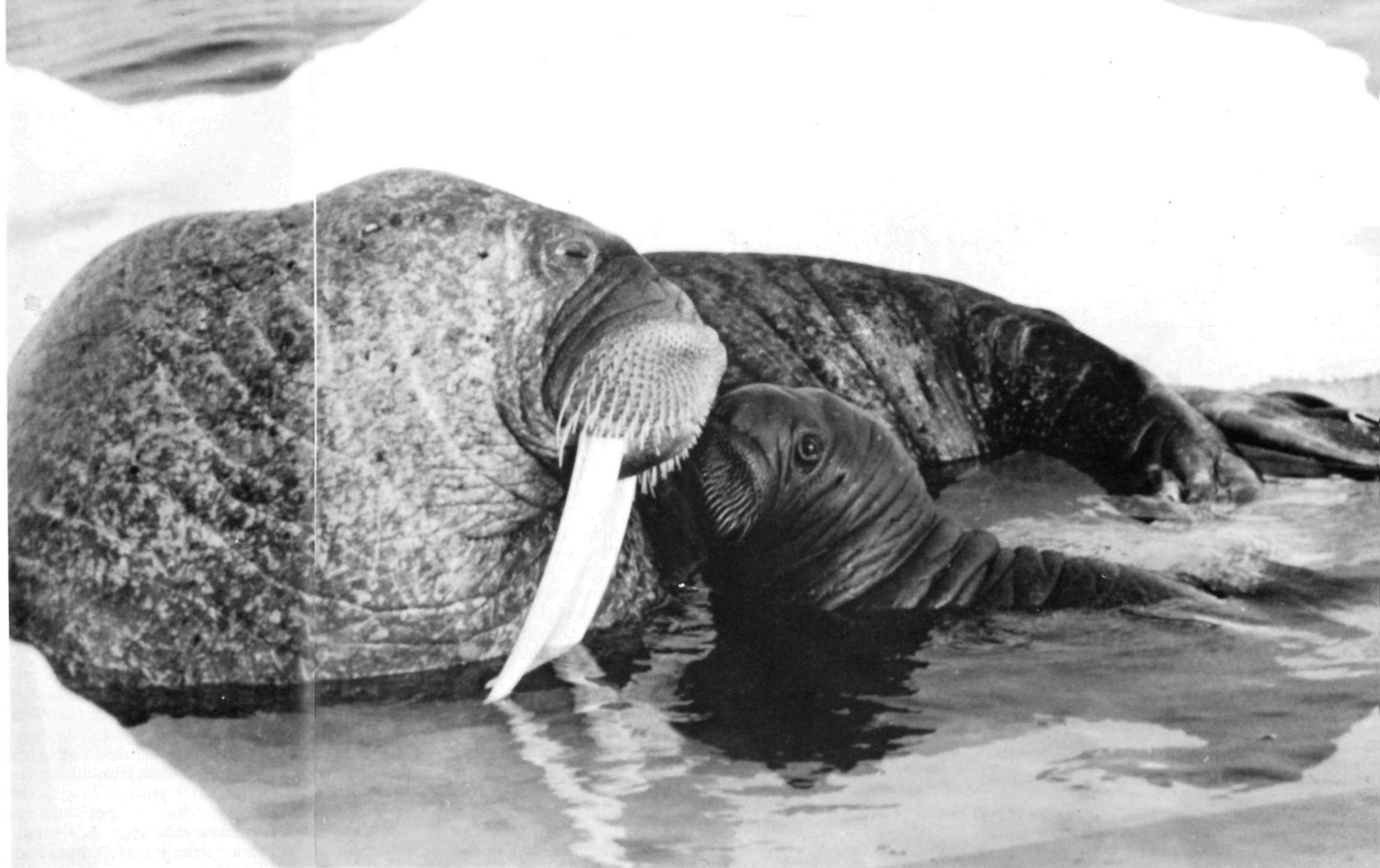
By another view, however, the walrus is an impressive beast. Although we often see it on land or ice, hunkering about laboriously and jabbing its neighbor's backside with its tusks, in the water the walrus is at home, propelling its bulk with the grace and agility that mark the movements of other, sleeker pinnipeds (sea lions and seals). It inhabits shallow shelf waters where beds of clams and other invertebrates are only a short dive away. The walrus' eating habits are delicate, if a bit gluttonous. It rips off the tender siphons and feet of its molluscan prey, leaving their shells and viscera strewn across the ocean floor. Some scientists see walruses as the marine counterparts of earthworms; by disturbing the substrate and recycling nutrients, they enhance productivity throughout the food chain.

AMONG its closest relatives—the sea lions and seals—the walrus (*Odobenus rosmarus*) is unusual in many ways. Most pinnipeds are annual breeders, with mature females producing a pup every year during their prime. Female walruses, however, give birth only every second or third year, almost always to a single pup. Many seals nurse for a very short period—from a few days or weeks (in the case of phocids, or earless seals) to a few months (in the case of otariids, or eared seals)—after which the pup is abandoned by its mother. But in the walrus the maternal bond is firm and prolonged. Pups nurse for a year or more and remain with their mothers for two years.

The walrus' solicitude for its young was noted by early polar explorers. Fridtjof Nansen, a daring yet unusually sensitive Norwegian adventurer, told of killing two walrus pups near Franz Josef Land off the northwest coast of Russia. As the herd dispersed and fled into the water, only the mothers of the two dead youngsters remained on the ice:

One sniffed its little one and nudged it, apparently unable to understand what had happened. It only saw blood streaming from its head, at which it wailed and wept like a human mother.

When Nansen attempted to retrieve his catch, the mother walrus intervened:



GEOFF CARROLL

She grasped the carcass of the dead cub in one of her fore-flippers and disappeared with it into the depths. The second mother repeated this manoeuvre.

Walrus hunters sometimes exploited this care-giving behavior by harpooning and restraining a calf. It would emit what one hunter described as "a peculiar, plaintive, grunting cry, eminently expressive of alarm and of a desire for assistance." The wailing infant seldom failed to attract a detachment of well-meaning adults, who themselves became easy game for the ingenious, if ruthless, hunters.

UNFORTUNATELY, the walrus has been unable either to charm northern peoples or to de-

fend itself against them. In earlier times there may have been a measure of equality between the primitive native huntsman, armed with nothing more than a stone- or ivory-tipped lance, and the thick-skinned beast with its powerful neck and formidable tusks. But the walrus proved no match for the adventurers and profiteers who began probing its subarctic and arctic realm as early as the ninth and tenth centuries. A Norwegian expedition found walruses to be plentiful along the northwest coast of Eurasia in the late 800s, and the animals were soon set upon for their ivory and leather. Walrus hide was used in fashioning ships'

cables, and the tusks were highly prized for making ornaments. An extraordinary example of such medieval craftsmanship—the "Cross with Corpus of Christ," intricately carved from walrus ivory—is on display at the Cloisters, an annex of the Metropolitan Museum of Art in New York City.

In 1603 large herds of walruses were discovered on Bear Island in the Barents Sea by English explorers. Displaying an astonishing lack of fear of humans, the animals allowed the hunters to walk among them—sometimes shooting, sometimes stabbing with lances, often killing hundreds of walruses within a few hours. When William

Gordon visited the island in 1611, however, the walruses that remained showed a pitiful fear:

By no means would they [the walruses] go on those beaches and places, that formerly they have been killed on. But fortie or fiftie of them together, went into little holes within the Rocke, which were so little, steepe and slipperie, that as soon as wee did approach towards them, they would tumble all into the sea.

This tendency of walruses to shun haulouts on which members of their tribe have been slain is the basis for a time-honored taboo among native walrus hunters in Hudson Bay. Fred Bruemmer, in *Encounters with Arctic Animals*, describes an incident in northern Foxe Basin, near Igloodik, in which

APPROXIMATE PRESENT RANGE OF THE ATLANTIC WALRUS

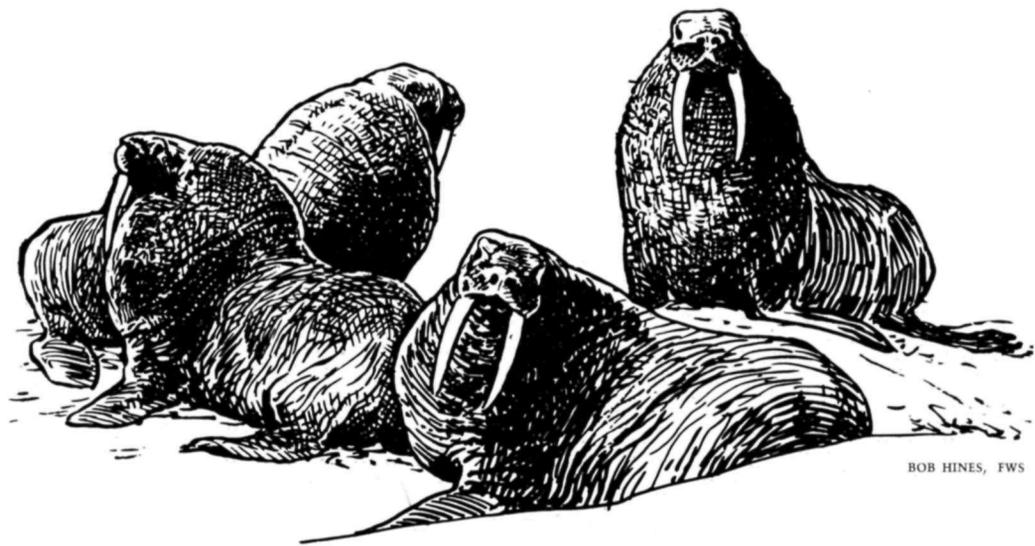


JAMES F. O'BRIEN

a group of young hunters killed some walrus on an *ugli*, or land (as opposed to ice) haulout: "Their elders were furious. They made the young men go back, and ordered them to dump all remains of the carcasses into deep water and to wash the place of slaughter thoroughly." Only by appeasing (or deceiving) the walrus in this manner could the elders feel confident that the animals would return to their ancestral rookery.

Such exemplary concern for the long-term availability of game, however, was not part of the commercial hunter's outlook. He did not intend to live in the arctic environment; he came only to take from it what he could, then leave. The consequences for walrus were disastrous. Few people seem to realize that tens of thousands of the walrus that once hauled out at or near Spitsbergen were as effectively exterminated as were the Greenland, or bowhead, whales in that region.

James Lamont, in his book, *Seasons with the Sea-Horses*, recounts what may be the most grisly walrus slaughter on record. It occurred at one of the islands of the Spitsbergen archipelago in 1852 and involved only sixteen men armed with little more than iron lances. They crept ashore unnoticed by a huge herd of walrus and began systematically stabbing to death the animals nearest the shore. Thus the men quickly managed to seal off the other walrus so that they were "in a manner



BOB HINES, FWS

barricaded by a wall of carcasses" from access to the water. According to Lamont, the men did not lay down their lances until nine hundred walrus had been slain, and their small vessels could hardly begin to accommodate the immense quantity of spoils. Arriving at this island six years later, Lamont found "abundant testimony to corroborate the entire truth of the story," for the beach was still strewn with flattened, rotting carcasses.

WALRUSES once inhabited the Gulf of St. Lawrence and Sable Island, off the coast of Nova Scotia, in some numbers, but, by the end of the eighteenth century, they had been hunted almost to extinction south of Labrador. As many as 1,500 are said to have been taken in a single hunt at the Magdalen Islands—their fat rendered into oil, their hides exported to the United States to be made into carriage traces and to England to be turned into glue, and their tusks sold for primarily ornamental uses.

Today the effective range of the Atlantic walrus (*O. rosmarus rosmarus*) is limited to northern Hudson Bay, the remote reaches of Foxe Basin, and northern Baffin Bay and its adjacent waters. A few hundred Atlantic walrus still exist off northeast Greenland, throughout the Spitsbergen chain, and at Franz Josef Land and Novaya Zemlya in the Soviet Arctic. A geographically isolated subspecies, the Laptev walrus (*O. rosmarus laptevi*), per-

sists in the central Arctic of Russia, numbering perhaps several thousand.

The only real stronghold of the species today is the area between Alaska and northeastern Siberia, where another subspecies, the Pacific walrus (*O. rosmarus divergens*), still flourishes. Recent estimates of its total population have ranged as high as 200,000.

EVEN IN THE ABSENCE of its most destructive enemy—man—the walrus would not live without fear. At least two other formidable inhabitants of the arctic regions prey on walrus. Polar bears are probably their most serious natural predator. According to Carleton Ray, a professor at Johns Hopkins University who has spent much of the past fifteen years studying walrus in the Bering and Chukchi seas, pups are usually the last to tumble into the water when a group of walrus is disturbed. In his view, this factor makes them especially vulnerable, particularly during winter when access to the water is limited by ice cover. Numerous reliable accounts exist of walrus-hunting polar bears, and scientists think that in some areas they contribute significantly to the mortality rate of young animals.

The role of the killer whale as a predator of walrus is less well documented. Where their ranges overlap, doubtless there is a certain degree of rivalry, and the appearance of killer whales can cause a

swimming herd of walrus to scramble onto the nearest available land or ice. However, the walrus is by no means a passive victim. As Richard Perry notes in his book, *The World of the Walrus*:

There is certainly one authentic record of a bull walrus, on being approached by a pack of killers when lying out on a floe, plunging into the water among them and subsequently surfacing with his tusks deep in one killer's back.

When provoked or hungry, the walrus can itself be a fearsome predator. Seal blubber is found in walrus stomachs with surprising frequency, and some "rogue" walrus are believed to subsist primarily on ringed and bearded seals. But the walrus' dentition is poorly adapted for ripping and tearing warm-blooded prey, so carnivorousism is clearly an anomalous characteristic. Nineteenth century British whalers sailing across the Norwegian and Greenland seas in search of bowhead whales sometimes saw walrus preying on narwhals. A vivid account of such behavior was provided by Robert Gray, whose father killed a large bull walrus in the process of disemboweling a fourteen-foot narwhal, whose five-foot tusk had apparently served poorly, if at all, as an implement of defense. Gray's father explained the walrus' success this way:

The only way I can think of is that [the walrus] found the narwhal asleep, gone underneath him, dug his tusks into his belly, and clasped him round the body with his flippers, in which position we found them, with this difference, that the walrus was uppermost.

IN RECENT TIMES the use of firearms and motorized transportation in the Arctic has distorted the long-maintained balance between primitive human communities and the herds of walruses, seals, musk oxen, caribou, and polar bears on which they depended. Today, natives hunt with little regard for ancestral methods of capture or utilization, so that in most areas stocks of local game are seriously depleted. Instead of stalking and harpooning individual walruses and thereby ensuring a high rate of retrieval, most hunters in Canada and Alaska shoot indiscriminately into groups of animals hauled out on cakes of ice, wounding many that then slide into the water to die a slow and painful death. Walruses that die in the water sink almost immediately, and thus can seldom be retrieved. Even those that are recovered are not often butchered and utilized as fully as they might be. Because walrus tusk ivory is valued at more than \$30 a pound, "head-hunting" is common. Scores of headless carcasses at a time have been known to wash ashore on the Alaskan coast, gruesome testimony to the wasteful slaughter taking place on the sea-ice.

OUTSIDE of northern Greenland few native hunters maintain dog teams. Instead they rely almost exclusively on snowmobiles or airplanes for winter transportation. Thus, although the value of tusk ivory and the joy of hunting may still lure some men to launch expeditions to walrus *uglit*, the incentive to hunt walruses for dog-food is gone. In addition, new industries such as mining of minerals and fossil fuels, and new jobs offered by military bases and private commercial ventures, together with such social institutions as welfare, have drawn native men and their families away from their traditional manner of living. In many cases this change in lifestyle has relieved the hunting pressure on species like the walrus; unfor-

tunately, however, new threats have emerged to replace overhunting, and arctic animals may still be in trouble.

In Canada, for instance, DEW-line construction is said to have caused the abandonment by walruses of at least one traditional haulout, and there can be little doubt that the hustle and bustle accompanying development in the arctic region will continue to diminish the amount of habitat suitable for this highly specialized mammal. The use of ice breakers, the creation of artificial islands, constantly increasing tanker traffic, as well as pipeline construction, all promise to transform the walrus' icy homeland into a much busier, more crowded, and more polluted place than it was. Having retreated literally to the end of the earth, this magnificent beast has no choice but somehow to become accustomed to close contact with modern man and his machines. Mindless "head-hunting," oil spills, and harassment taken together already constitute a real threat to the continued existence of some local walrus populations. In addition, the species may soon be competing directly with humans for food, such as clams, now in demand by canneries.

There is reason to believe that little genetic interchange takes place between widely separated herds of Atlantic walruses. Thus it is crucial for the survival of local populations that at least some groups be left strictly alone—neither hunted by native peoples nor disturbed by tourists or commercial enterprises.

Although walruses are still abundant in segments of their wide range, their continued existence is genuinely threatened in some parts of it. In particular, the small remnants of the once-large stocks at Bear Island, Spitsbergen, Franz Josef Land, and Novaya Zemlya face a doubtful future. In spite of the fact that walruses in these areas are now offered some degree of protection, only time will tell

whether they can recover from past depredations.

Norway has not only forbidden her citizens from hunting walruses since 1952 but has established several reserves on the Spitsbergen archipelago where walruses and other wild creatures will be left entirely alone. Atlantic walruses have been protected from commercial hunting in the Soviet Arctic since the late 1950s, but scientists there continue to press their government for additional protection from poaching and harassment. Greenland National Park in northeastern Greenland encompasses most of the walrus' range on that coast, and small pods of walruses are sometimes seen in waters bordering Canada's Baffin Island National Park.

THE DAYS WHEN the icy shores of the Spitsbergen islands would suddenly come alive with heaving heaps of walrus flesh are past and not likely to return in our lifetime. Yet we may not be overly optimistic to hope that the days of uncontrolled hunting, as well as mindless alteration of wildlife habitat, are finally on the wane. At the turn of this century perhaps as few as a hundred northern elephant seals—the only Northern Hemisphere pinnipeds larger than walruses—remained on this planet. After a long period of protection this species has rebounded to almost fifty thousand strong. Let us hope that a similar story may one day be told of the Atlantic walrus—that noisy, foul-smelling, clam-grubbing, gloriously improbable work of Nature's art. ■

Randall R. Reeves, who is currently participating in the University of Rhode Island's Cetacean and Turtle Assessment Program, has carried out extensive research on marine mammals for the Smithsonian Institution, the Marine Mammal Commission, and the National Fish and Wildlife Laboratory. His article on the endangered right whale appeared in the February 1979 issue of this magazine.

Will plans for a massive acceleration in coal use lead to environmental nightmares?

by J. RUSSELL BOULDING

COAL: Saviour or Demon?

THERE'S both good news and bad news about coal in relation to the energy crisis. The good news is that the United States has abundant coal reserves that can be used to reduce our dependence on foreign oil and ease the transition to renewable energy resources. The bad news is that we will probably have to use it. Coal is one of the cornerstones of the National Energy Plan that President Carter announced in April 1977 and of the National Energy Act passed by Congress in October 1978. One of the major goals of the plan is to reduce the use of costly imported oil and dwindling natural gas supplies by increasing the use of coal. In order to accomplish this object, coal production would be greatly accelerated; at the maximum, it would almost double from 688 million tons in 1977 to 1.3 billion tons by the end of the century.

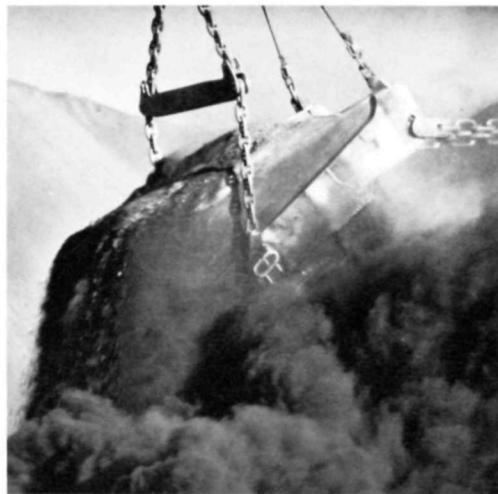
Coal is recovered both by deep mining underground and by strip mining of the surface. Since World War II, and especially since the mid-1960s, however, there has been a growing reliance on strip mining. The environmental prob-

lems associated with strip mining coal are legion,¹ and the cost to society of both surface and deep mining has been staggering.

- *The Appalachian Regional Commission estimated in 1969 that capital expenditures for cleaning up acid mine drainage caused by coal mining in Appalachia would exceed \$6.6 billion. Annual costs to water users in the region for treatment and repair of damage by corrosion exceeded \$3.5 million. Considering inflation, the price tag is probably much more than that today.*

- *The Center for Science in the Public Interest in Washington, D.C., estimates that property damage from improper blasting practices in surface coal mines in Appalachia and the Midwest exceeded \$200 million in 1975.*

- *The cost of a single flood in April 1977 in Harlan County, Kentucky, exceeded \$2.2 million in administrative costs and disbursements by government relief agencies. The severity of this flood was attributed to stream channels choked with sediment as a result of strip mining in the watershed.*



GORDON ANDERSON

- *An unpublished report by the U.S. Bureau of Mines says that subsidence from underground coal mines has caused millions of dollars in damage to buildings, pavements, and subsurface pipelines. Some 158,000 acres of urban areas are built over mined-out coal seams and are susceptible to subsidence damage.*

The coal industry argues that improvements in mining methods can avoid the environmental abuses of the past, and in many cases this is true. Certainly environmentalists were pleased that the National Energy Plan included a commitment by President Carter that any increased use of coal be accompanied by strict environmental controls of both mining and burning coal. In August 1977 he signed into law two acts of Congress designed to do this—the Surface Mining Control and Reclamation Act, and Amendments to the Clean Air Act. Because accelerated production of coal could easily turn into an environmental nightmare, environmentalists view these laws as absolutely essential checks on pollution.

The Ravages of Strip Mining



ACE HOFFMAN STUDIOS IN APPALACHIA, FEB. /MAR. 1972



DOE PHOTO

JAN W. FAUL IN APPALACHIA, OCT. /NOV. 1974



THE STRIP MINE LAW was the culmination of years of effort by the environmental movement to establish national legislation that could prevent the devastation caused by poor mining practices. Twice previously Congress had passed legislation only to have it vetoed by former President Ford. Ironically, the coal industry would have done better to settle for one of the earlier weaker bills. Although the law did not include all the provisions environmentalists had lobbied for, it was a clear victory for the environmental movement. The law includes special provision for protection of prime farmland in the Midwest and alluvial valley floors in the West, procedures for designating lands as unsuitable for mining, requirements that topsoil be saved and replaced and that approximate original contour be restored, strong protection from blasting for nearby property owners, and a ban on indiscriminate dumping of mine spoils. It prohibits new strip mining operations in the national park, wildlife refuge, trails, wild and scenic rivers, and wilderness systems. The law also applies to the surface effects of underground mines, an environmental problem that had been controlled even more inadequately than strip mining.

The Clean Air Act Amendments of 1977 included a number of compromises that environmentalists were unhappy with, but the amendment relating to coal-fired power was firmly in favor of the environmental position. It required that best available control technology be used to reduce sulfur dioxide emissions from *all* new coal-fired power plants. The utility industry had lobbied heavily to be allowed to substitute the use of low-sulfur coal for emission controls.

UNFORTUNATELY, laws are only as good as their application and enforcement. Events fol-

lowing the passage of the strip mine act and the clean air amendments give no cause for complacency in the environmental movement. First of all, national energy policy remains in a shambles. Congress response to Carter's challenge to quickly pass comprehensive energy legislation was to haggle for almost a year and a half before passing in October 1978 a piecemeal hodgepodge of laws inappropriately called the National Energy Act. Most of the good proposals developed by the White House were either dropped or so watered down as to have little effect.

In spite of a few bright spots, the strip mine act has fared little better. The law created a new agency called the Office of Surface Mining (OSM) in the U.S. Department of Interior. Its main responsibility is to administer an interim regulatory program until states are able to develop permanent programs that comply with minimum standards established by the Office. If a state is unable to develop a satisfactory program, the OSM steps in and administers its own program.

Appointments to top level staff positions in the OSM pleased environmentalists. Walter Heine, the Director, previously headed Pennsylvania's strip mine program, which had a reputation for being the toughest in the country. But the Office has been hampered from the start by Congress' failure to appropriate funds to staff the agency quickly, and only now, two years after passage of the Act is the staff close to full strength. Further difficulties have been created by tight deadlines established by Congress to implement different phases of the Act.

Few government agencies have had as rough and stormy an entry into the world as the OSM. Having failed to block passage of the strip mine law, the coal industry gave OSM a broadside by challenging the interim regulations that the

agency developed in eleven separate lawsuits. Several environmental groups intervened in the litigation on the side of OSM, and industry's attempts to significantly weaken the interim regulations failed.

The legal challenges to the interim regulations were a minor skirmish, however, compared to the battle that has raged over the *permanent* program regulations. The draft regulations published in September 1978 ran 274 pages of small type and were reasonably tough. The stakes were high in the fight over these regulations, and OSM has been caught in a crossfire between environmentalists, the coal industry, and several major coal states.

To environmentalists the regulations meant the difference between a law with teeth and an ineffective law. Environmentalists were particularly disappointed that the proposed regulations did not make better provision for citizen participation in the regulatory process.

To the coal industry failure to weaken the regulations meant it was going to have to work a lot harder to protect the environment.

To the states, particularly those that had been lax in controlling strip mining, the proposed regulations meant shaping up if they were to be allowed to continue regulating mining.

The dust will have to settle before the effect of the regulations can be assessed, and it is hard to draw definite conclusions about how effectively the environmental impacts of strip mining will be controlled as a result of the law. It is safe to say that the widespread abuse of the past will not be repeated, at least not on the same scale. The most serious environmental effects of mining coal *can* be controlled under the new law. The question that remains is whether they *will* be, especially if coal use doubles.

EFFECTIVENESS of the clean air act is similarly uncertain. The clean air amendments required the U.S. Environmental Protection Agency (EPA) to establish emission standards for sulfur dioxide (SO₂) based on best available control technology, regardless of the sulfur content of the coal used. In September 1978 EPA proposed that all new power plants remove 85 percent of the SO₂ from emissions—a standard at least 5 percent less than environmentalists say is possible with current technology but still much stricter than previous requirements. EPA also considered tightening the current emissions ceiling of 1.2 pounds per million BTUs.

But by press time in May 1979, environmentalists said that the Carter Administration apparently had "caved in" to pressures on the President from industry and some senators from coal-producing states. EPA reportedly was preparing to announce not only a sliding scale of 70 to 90 percent removal—varying by sulfur content—but also an essentially status quo emissions ceiling. Environmentalists protested that such a combination would be both disastrous and illegal.

Accelerated use of coal—especially a doubling by 1985—will result in a significant increase in total emissions of pollutants. Although it is difficult to predict exactly what the health effects of such an increase will be, an increase can be expected to cause premature mortalities and increased respiratory ailments.

In fact, a new report by the Office of Technology Assessment of the U.S. Congress, *The Direct Use of Coal*, concludes that "although different studies show a considerable range of pollution/death rate associations, the majority of these studies . . . indicate that several tens of thousands of premature deaths annually are associated with current pollution levels." The statistical data in these studies, the

report notes, are not conclusive—they are criticized from within the health community. Nevertheless, a positive link between coal-related pollution and danger to human health cannot be ruled out, and failure to require full scrubbing of coal "incurs the risk that significant health damages may occur." The report had been released just a few days before the news of the Administration's change of mind on the EPA regulations.

Most people realize that few occupations are more hazardous in terms of accidental death and injury than coal mining. (Deep mining is considerably more dangerous than surface mining, but even the safety record in surface mining is not particularly good.) Few people are aware, however, that the dangers of a coal-fired power plant to the general public may exceed the occupational hazards of mining the coal that feeds it.

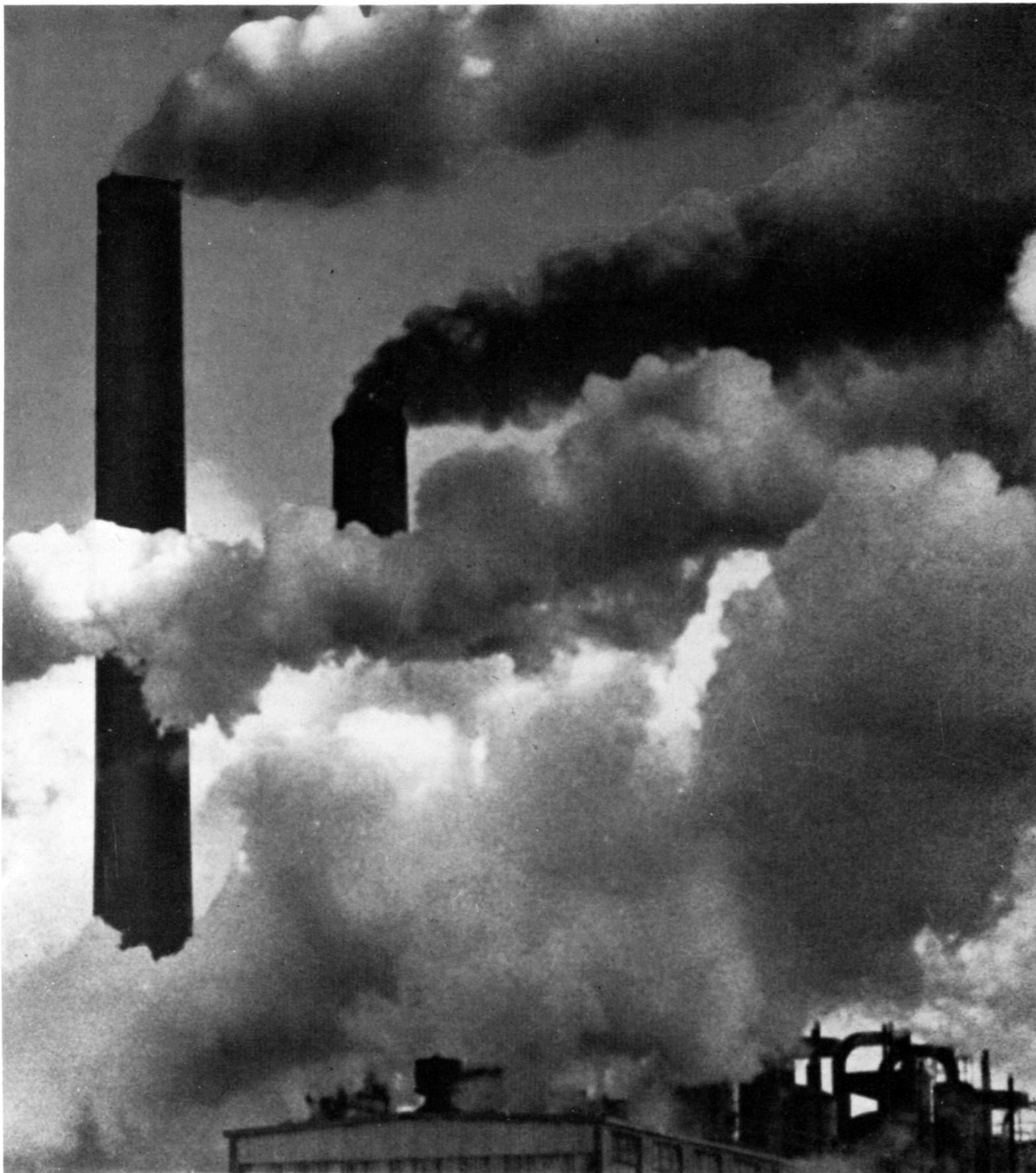
A study done by Argonne National Laboratory in Illinois has estimated that the number of accidental deaths each year caused by trains moving coal from Wyoming to a power plant in Illinois would be almost twice the number of accidental deaths in an underground mine in Illinois producing coal for the same power plant. A recent study of the overall occupational and public health hazards of coal-fired power plants conducted by Resources for the Future in Washington, D.C., concluded that in the worst case the general public could experience five times more deaths from a single power plant than the workers who mine the coal and maintain the plant.

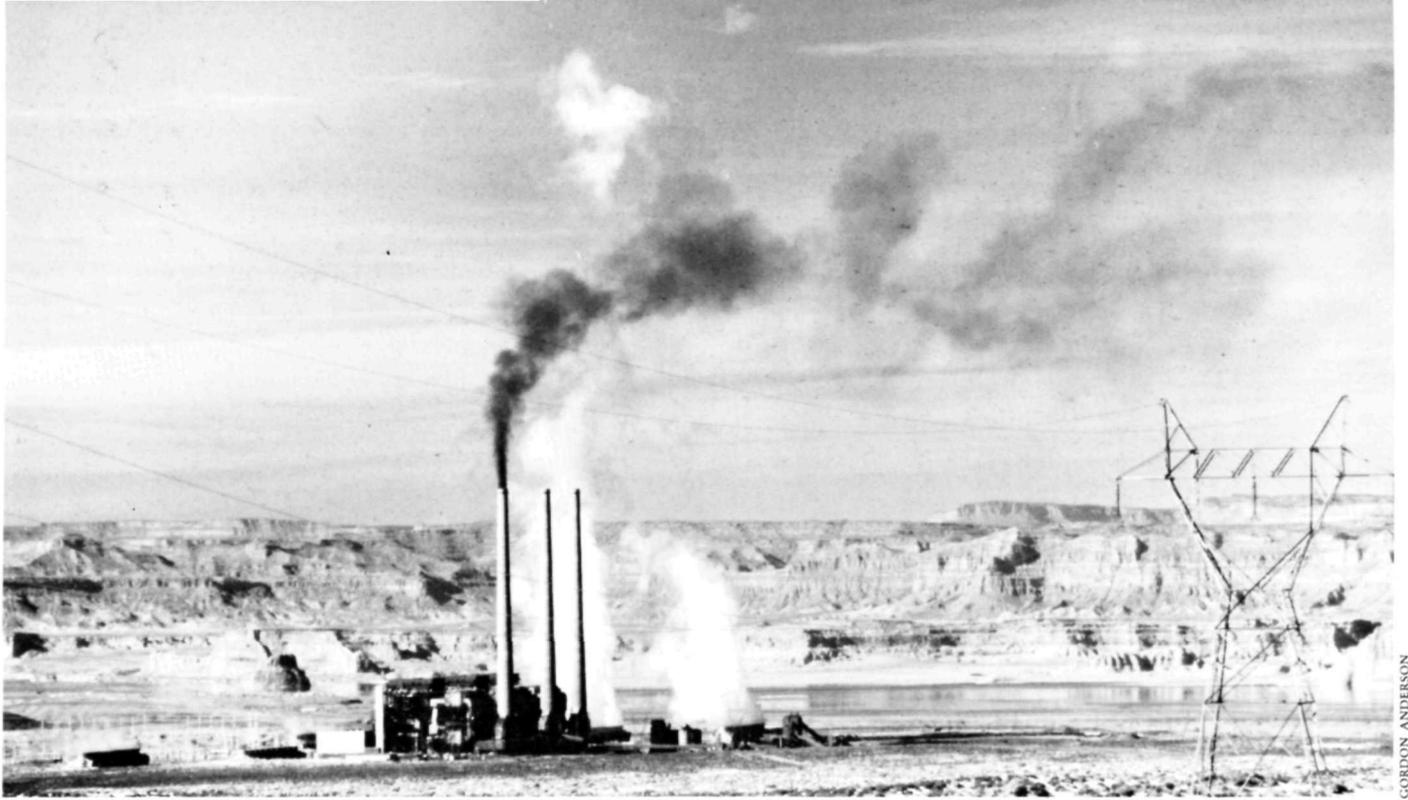
The environmental effects of a strip mine may be devastating, but the effects tend to be confined to the immediate watershed of the mine. The environmental damage of burning coal, while not so dramatically visible, is much more far reaching and sinister. In addition to the effects on health of air pollution, sulfur dioxide from power plants in the Midwest ends up fall-

ing as acid rain²—sometimes even hundreds of miles away. Sulfur dioxide emissions over the past forty years have increased the acidity of rainwater in the East to the point that rainfall is sometimes more acid than vinegar. Soils and forests are being degraded, and crop damage can be reckoned in hundreds of millions of dollars. Thousands of lakes in the Northeast are now uninhabitable by fish. Buildings made of limestone and marble are slowly disintegrating.

Even if technological advances make it possible to increase the use of coal without increasing total air pollution (fluidized bed combustion and cogeneration show much promise), there is a longer term and more intractable problem with coal that has global implications. Burning coal releases carbon dioxide (CO₂) into the atmosphere.

Since 1860 when the industrial revolution ushered in the widespread use of fossil fuels, CO₂ in the atmosphere has increased at a yearly rate of 4.3 percent. Although carbon dioxide is nontoxic (in fact it is essential for plant growth), it can have the effect of trapping in the atmosphere solar heat that is normally radiated back into space (the "greenhouse" effect). A recent study by the Mitre Corporation concluded that heavy combustion of coal and other carbon-based fuels will lead to a doubling of atmospheric carbon dioxide in less than a hundred years. Such a doubling would cause an average increase in global temperatures of 2°C (3.6°F). At high altitudes the increase could reach 8° to 10°C, or as much as 18°F. Such an increase in temperature would melt the West Antarctic ice sheet, submerging coastal areas and raising worldwide ocean levels by five meters (more than sixteen feet). In addition, unknown but likely drastic changes in precipitation and agricultural productivity would ensue. The thought of man forcing such a massive change on the global environment is alarming.





GORDON ANDERSON

From 750-foot beauty stacks, Arizona's huge Navajo Plant—one of nine such coal-fired power plants on the Kaiparowits Plateau—belches forth smoke that at times besmogs Grand Canyon National Park, fifty miles to the southwest.

IS COAL a saviour or a demon? the way to energy self-sufficiency, or the source of increasing global pollution? In the context of present energy policy and judging from the obstinate reluctance of the coal mining and electric utility industries to submit to necessary environmental regulations, I am inclined to feel it is a demon. But lurking in the background of any discussion of coal is another demon—nuclear energy. The crisis at the Three-Mile Island nuclear power plant near Harrisburg, Pennsylvania, in April dramatized some of the dangers of nuclear energy. There are others.³ For one, the problem of where to store waste that will be dangerously radioactive for thousands of years has not been solved.

We are going to have to make some tough choices in the coming years. Alternative renewable energy resources such as solar, wind, and bioconversion can be substituted for coal and nuclear; but they tend to be less convenient and more expensive than the easy energy we have grown to expect from the flick of a light switch and turn of an ignition key. Also, these alternative energy resources cannot

maintain on a global scale the consumptive lifestyle that most Americans lead. This lifestyle has been built on cheap oil and gas that were relatively benign environmentally. In order to maintain this lifestyle, we are having to substitute more expensive coal that is environmentally malignant. Is the health and environmental price worth it?

WE CAN DO several positive things to help prevent demon coal from getting the upper hand. These actions include working against attempts by industry to weaken existing laws for environmental protection, supporting strong regulations to implement these laws, taking advantage of citizen enforcement provisions of the strip mine and clean air acts, and changing personal energy consumption patterns to reduce the need for fossil fuels.

In fact, a new report by the President's Council on Environmental Quality, *The Good News About Energy*, says that low energy growth through more efficient utilization of the energy we produce would enable us to have a healthy, expanding economy while limiting

new coal and nuclear plants to those now ordered or under construction. Such action would not solve our energy problems by any means; for example, acid rain will continue to be a problem even with present production. But it would be a long step forward. If enough people practice energy conservation and insist on less wasteful practices in industry, business, and government, perhaps we won't need to accelerate coal production so radically. ■

Russell Boulding is a free-lance writer and environmental consultant with training in geology, soils, and water resources management. He has published articles on environmental issues in *Environment*, *The High Country News*, and *The Louisville Courier-Journal*.

Notes

1. See "Strip Mining and the Environment," by Branley Allan Branson, *National Parks & Conservation Magazine*, April 1977.
2. See "Acid Rain Fallout: Pollution & Politics," by James Gannon, *National Parks & Conservation Magazine*, October 1978.
3. See "What Price Plutonium?" by Russell W. Peterson, *National Parks & Conservation Magazine*, August 1977.

NPCA at work

CONCESSIONS

Concessions Policy "Sells Out" Parklands for Private Corporate Profit

The National Park Service is operating with tied hands and is incapable of controlling private concessioners throughout the National Park System, NPCA charged at recent hearings of the Senate Parks Subcommittee.

"Large conglomerate corporations have taken over the businesses which provide service to park visitors in many of the national parks," the Association testified. "As a result of these concessioners' inordinate political influence and the outdated and unworkable provisions of the Concessions Policy Act of 1965, they make far too many management decisions which should be the responsibility of the National Park Service," NPCA said.

Rather than managing these parklands so as to leave them unimpaired for future generations, as required by the Park Service's Organic Act of 1916, the existing philosophy on development inside the Park System for concession facilities reflects unyielding devotion to an unsuitable luxury motif. Thus, the parks are festooned with a proliferation of inappropriate lodging, gift shops, service stations, golf courses, downhill ski facilities, and other developments suited to a weekend resort rather than to the natural recreational settings that national parks are intended to provide. Pressure for conventions in the parks and other incompatible uses increases.

Although in the past widespread public attention has focused on the Music Corporation of America and its stepchild in Yosemite National Park, the Yosemite Park and Curry Company, that corporation is but one example of a trend in recent years toward purchase of major concession operations by large conglomerate businesses. The AMFAC Corporation bought the Fred Harvey Company in Grand Canyon National Park and hotel inholdings at Death Valley National Monument. TWA Airlines, which owns TWA Services, Inc., in Bryce Canyon, Zion, and Grand Canyon national parks, recently acquired the concession operations in Crater Lake National Park and operates concessions in Death Valley National Monument. ARA-Skyline Services operates the concessions in Shenandoah National Park. More recently, the Del E. Webb Corporation purchased a number of independent concessions in Glen Canyon National Recreation Area. NPCA provided the subcommittee with details on problems in those parks.

NPCA also pointed out that although the NPS has been trying to regain some measure of control over these concessioners in recent years, the Concessions Policy Act provisions will have to be totally reformulated, if not repealed, before the agency will once

again be in complete control of the nation's priceless parklands.

For instance, NPCA cited an Interior Department report critical of the fact that under the Act NPS requires concessioners to invest large sums of money in government-owned facilities, and thus gives them a "possessory interest" in the facilities and services in the park. The report says this possessory interest "amounts to a sale of a portion of our parklands for the sake of financing visitor facilities, but with the consequent possibility of inability to properly control and manage for the benefit of the public the facilities thereby constructed."

In Yellowstone National Park, for instance, the Park Service confirmed longstanding charges by NPCA and other conservation organizations by documenting unsanitary and ill-managed concessions facilities operated by General Host Corporation. As a result, the 95th Congress authorized NPS purchase of the possessory interests of this particular concessioner. Similar transgressions occur systemwide, however.

The other major deficiency of the Act, NPCA pointed out to the subcommittee, is the granting of "preferential rights" to existing concessioners. These rights give them first preference on new services and con-

Continued on page 23

ADJACENT LANDS

"Sewering" the Countryside Around Assateague & Gettysburg

NPCA has rigorously opposed a Maryland wastewater treatment plant whose sewage outfall pipe would cut right across Assateague Island, touching on Assateague Island National Seashore. The plant would induce a proliferation of development on agricultural lands and floodplains north and west of the seashore—endangering NPS lands and the productive bays west of the national seashore.

In detailed comments on an environmental impact statement for the project, NPCA described a variety of other problems including threats to endangered species such as the pere-

grine falcon. This Association told EPA that the North Central Ocean Basin Regional Wastewater Treatment Facility "must not and cannot be approved" because it violates EPA's own regulations as well as state and federal laws. At press time, EPA's decision on the project was expected by May.

A similar situation has developed in Pennsylvania, where a local government wants to construct a large wastewater treatment plant and collection system on lands near Gettysburg National Military Park. Like a number of other "adjacent lands" projects described in our March and April 1979

Magazine issues, a large facility and system of this size and type could lead to incompatible development around the park.

In this case, however, EPA is just beginning to prepare the draft environmental impact statement on the proposed project, so members can still become involved early in the process.

You Can Help: If you want to assist NPCA in protecting the historical resources at Gettysburg from development on adjacent lands, please write Program Department, NPCA, 1701 Eighteenth Street, N.W., Washington, D.C. 20009. ■

Be An NPCA CONTACT

Looking for a way to be a more active member of the conservation movement? Want to translate your interest in the national parks and the environment into concrete action? Why not join NPCA's CONTACT program?

Members continually ask how they can become more active in NPCA's programs involving National Park System lands, forests, wildlife, population/immigration, and other environmental concerns. In response to this interest, NPCA organized a CONTACT program three years ago. Since then the number of members involved has steadily increased and the program's scope has broadened.

All CONTACT participants must be members of NPCA. As a CONTACT, you will receive ALERTS from NPCA staff on important park and environmental issues. These ALERTS include suggestions for specific actions—such as letter-writing or testifying at hearings—that members can take to assist NPCA's efforts.

Although our CONTACT program is going strong, to be fully effective it needs more participants. If you want to be more involved in NPCA programs, just fill out the form below and mail to Programs, NPCA, 1701 18th St., N.W. Washington, D.C. 20009. We look forward to working with you

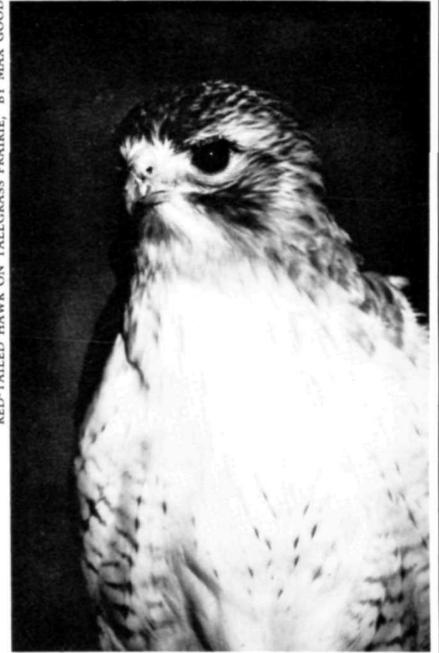
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NPCA at work

Concessions—from page 21

tract renewal. The result is a total absence of meaningful competition, often producing poorer service to visitors and a disdainful attitude toward protection of park resources on the part of concessioners. NPCA told the subcommittee that "the Park Service is either unable or unwilling to terminate a concessioner's contract for unsatisfactory performance."

Thus, the concessioner is still King in the parks, even in the face of documentation showing concessioner-related damages to park resources, poor visitor service, safety hazards, and unhealthy conditions. Amendment of the Concession Policy Act is essential if the parks are to be adequately protected and good services provided.

In other developments, at press time Sen. Howard Metzenbaum was expected to introduce legislation to rewrite the Concessions Policy Act. The new Concessions Policy Act of 1979 would feature reforms that NPCA has been advocating for several years.

You Can Help: Interested members can express their concerns about concessions reform to Sen. Dale Bumpers, Chairman, Parks Subcommittee, 3102 Dirksen Senate Office Building, Washington, D.C. 20510. ■

ILLEGAL IMMIGRATION INS Enforcement in Chaos

Pointing to "internal confusion, chaos, and mismanagement" within the U.S. Immigration and Naturalization Service (INS), NPCA recently called proposed cuts in that agency's budget "penny-wise and pound-foolish," reflecting a policy by INS leadership of closing their eyes to the serious problem of illegal immigration.

INS Commissioner Leonel J. Castillo and INS officials presented testimony to House and Senate subcommittees indicating that the agency could operate with a cost-conscious budget \$6.5 million below the appropriation for Fiscal Year 1979. NPCA testimony responded that,

To those of us who follow developments in immigration closely, Commissioner Castillo's testimony that his agency could manage well on a reduced budget through a minor reshuffling of

Continued on page 26



CARIBOU CALF BY STEPHEN J. KRAEMANN

Wilderness Parklands in Alaska

Edited by Eugenia Horstman Connally

Paperbound, color cover, 84 pages, fully illustrated, \$2.95 each.

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conservation docket

Olympic Park Deletion

Congress may soon be considering a resolution to block deletion of lands on the north side of Lake Quinault from Olympic National Park. The land in danger—some 2,168 acres in a strip along the lake and the Quinault River Valley—consists of private inholdings.

Although 94 percent of the land remains in undeveloped old-growth forest, small-scale logging and the construction of two subdivisions signal a need to protect this scenic area from further encroachments. The residents have carried on a thirty-eight-year battle to have the lands deleted from the park, whereas NPCA and other conservation organizations have opposed deletion. In 1976 Congress passed a law calling for an NPS study investigating the uses of the land and implications of excluding it from the park. The law says that ninety days after submission of the report to Congress, up to 2,168 acres will be deleted unless Congress passes a resolution to the contrary.

The Park Service has completed the

study and has opposed deletion of the land, pointing out that "Private development in and around the lake is . . . sure to have adverse impacts on the environment in or near the park and on the fishery habitats owned by the Quinault Indians. The tribe opposes deletion. . . . Additionally, deletion establishes a precedent for legislation aimed at other inholdings in national park areas."

The ninety-day period had not yet begun at press time, but submission of the report to Congress was expected in late spring. ■

Channel Islands Expansion

In early May the House passed legislation introduced by Rep. Robert Lagomarsino (R-Calif.) to expand the Channel Islands National Monument in California and redesignate it as a national park. Santa Cruz, Santa Rosa, San Miguel, and Prince Islands—with a combined acreage of more than 120,000 acres—would be added to the NPS unit. Santa Cruz and Santa Rosa is-

lands are luxuriant with plant life. The latter is surrounded by kelp beds important to wildlife. Santa Cruz harbors the endangered Channel Islands fox, brown pelican, and nine rare or endangered plants. San Miguel includes one of the largest known colonies of sea elephants. (See October 1975 *National Parks & Conservation Magazine*.) The northern Channel Islands have been endangered by possible resort development and plans for oil and gas leasing.

NPCA supports expansion of the national monument and worked with Rep. Lagomarsino to correct certain deficiencies in the bill such as provisions relating to lands in private ownership.

Rep. Phillip Burton (D-Calif.) initiated Channel Islands legislation a number of years ago. During the previous Congress Sen. Alan Cranston (D-Calif.) and Rep. Anthony Beilenson (D-Calif.) introduced expansion legislation, but it was dropped from another legislative package. Rep. Beilenson introduced legislation again this year and Sen. Cranston is expected to do so soon. ■

National Heritage

NPCA has supported the Administration proposal for a National Heritage Program. At press time a bill to establish the program had been sent to the Secretary of Interior and the President's Office of Management and Budget for clearance and was expected to be under consideration on Capitol Hill by publication time. The program calls for a process of inventory, classification, identification, and protection of the resources of our nation that contribute to our natural and historical heritage. It establishes a National Register of Natural Areas and incorporates the existing National Register of Historic Places as well. Various mechanisms would protect areas determined to be of national significance. ■



Voyageur Country

A Park in the Wilderness by Robert Treuer

Here is the history of a beautiful region of lakes and forests on the Minnesota-Ontario border and of the eighty-year struggle to establish it as Voyageurs National Park. Named for 17th-century French fur traders, the area was designated a national park in 1971. Still in the early stages of development, this wilderness park is a magnificent symbol of environmental concern. *8 pages of color photos, 11 black-and-white photos, 3 maps.* \$10.95

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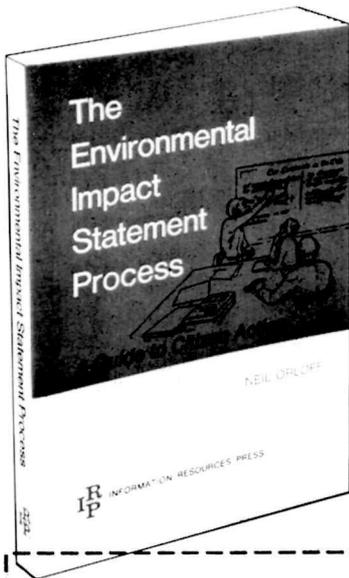
This remarkable book also lists the names and addresses of government officials who are directly responsible for each agency's preparation and review of impact statements!

BY NATIONAL AUTHORITY

Neil Orloff was Assistant Director of the Environmental Protection Agency's Office of Federal Activities in charge of the review of environmental impact statements. Subsequently, as legal counsel to the President's Council on Environmental Quality, he helped develop the governmental guidelines for the operation of the environmental impact statement process. He currently teaches environmental law at Cornell University.

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NPCA 39 YEARS AGO



NPCA at work

At the twenty-first anniversary dinner of the National Parks Association in May 1940, Newton B. Drury, Secretary of the Save-the-Redwoods League, spoke about the need to preserve the native landscape in California and the broader issue of public lands preservation. Shortly thereafter, Drury became NPS director. His 1940 remarks, parts of which follow, are still relevant today.

Here, in these typical reserves, with their variety of scenery and interest: redwood forest, rocky seacoast, arid desert, pine-clad mountain; here in the Coast redwoods, Point Lobos, Anza Desert, Mt. San Jacinton, and in a few other areas of the California State Park System, increasing numbers are making a last stand for the ideal that the highest public use to which such lands can be put is to hold them in their natural perfection, to administer them in such manner that they may be available to our people of today and tomorrow for their rare boon of inspiration, of "re-creation" in the highest sense of the word through contact with unmodified Nature.

It would not be proper to deceive you into thinking that there is complete unanimity in California regarding these reserves. . . .

There is finally a state of mind, partly induced by some embattled recreationalists, which for want of a better term we might call a *democracy complex*. The argument runs something like this: "These are public lands; the people own them; therefore they should be used in all ways that give people enjoyment." This has been the Nemesis of some of our finest parks, national and state . . . This conception of democracy leaves me personally very cold. I have heard inappropriate and destructive activities in the midst of Nature's greatest creations condoned on the ground that "a great many people thereby have a great deal of fun." The same claim might be made for camping in a cathedral. It is not necessary to labor the point, but obviously there is here a line of thought that represents one of two things: either confusion as to true functions, or satisfaction with something less than the best that can be

done for the people with their properties. This, I submit, is not true democracy. Of course the people own the parks; of course they have a right to use them. But these lands are a heritage, and no one generation has a right to use them up.

Not long ago, when in the Library of Congress, with something of a thrill I came upon a great possession of the Nation: the copy of the Gutenberg Bible, which Congress saw fit to purchase for \$350,000, so great was its significance as a milestone in the progress of transmitting human thought. There it was, the property of the people, belonging to all; and yet, as a matter of course, you had to look at it in a glass case, while a uniformed guard stood by. No question of democracy here, that I know of. No question, even, of "multiple use." The terms upon which all of us could enjoy the experience of viewing it were determined and limited by the degree of its perishability and by the obligation of its custodians to pass it on to posterity unimpaired. Is it an unsound analogy to contend for equal care of the great works of Nature that are in our trust?

NEWTON B. DRURY

Newton B. Drury, fourth director of the National Park Service and honored conservationist, died on December 14, 1978, at the age of 89.

Under Drury's leadership from 1940 to 1951, the park system was enlarged by important additions such as much of the Everglades, Independence Hall National Historical Park in Philadelphia, and the Jackson Hole National Monument addition to Grand Teton National Park.

A native of San Francisco, Drury had helped establish both the California Division of Parks and the Save-the-Redwoods League in the early part of the century. Later, following his years as NPS director, he returned to California to head the state park division. For the past twenty years he had devoted much of his time to the redwoods.

Throughout his career Drury maintained the need to guard the national parks against intrusions that would impair them for future generations.

Immigration—from page 23

personnel came as a stunning surprise. For the last year, the INS has made news nearly every day, spotlighting internal management problems, its incapacity to cope with the rising tide of illegal immigrants, its breakdown of the immigration inspection system at points of entry, its inability to keep trained Border Patrol agents in the ranks because of poor pay and a prevailing enforcement philosophy that undermines the very meaning of their jobs.

At the same time that illegal immigrants apparently are coming across the border in larger numbers than ever, INS has proposed reducing its FY 1980 budget by eliminating 293 border patrol positions. The border patrol already is understaffed; as one example, NPCA noted, the Tucson, Arizona, sector estimates that it is now only 30 percent effective in apprehending unlawful crossers and smuggling operations. Likewise, INS would cut the criminal investigations staff. By contrast, NPCA called for increasing law enforcement and investigations personnel.

The Association representative noted that appropriating more money is one important step but will not make the problem go away by any means. Legislative remedies penalizing employers for hiring illegal workers are also needed. Otherwise, NPCA warned, "our present *de facto* immigration policies, if allowed to continue, will dash all our hopes of reaching a stable population level in America in time to avert ecological disaster." ■

GRAND TETON

EPA Opposes Airport

"If quiet is not preserved in our national parks and wilderness areas, where will those who wish to enjoy the sounds of the natural environment without the intrusions of man-made noise have to go in order to find it?" These words are not taken from an environmentalist magazine, but from official EPA comments on the Jackson Hole Airport Master Plan Environmental Impact Statement. EPA, in charge of national noise policy, has provided new ammunition in the long-standing fight to get the Jackson Hole airport out of Grand Teton National Park.

Continued on page 30

HANDY TIPS FOR PARK TRIPS

This list of publications and information of interest to park visitors is by no means a "complete" guide, but NPCA hopes from time to time to present helpful information for planning park vacations. Orders for the publications for which a GPO stock number is indicated should be sent to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Include title, stock number, and full payment by check or money order. (Publication titles are italicized.)

Pick a Park - Be Prepared

✓ **National Parks of the United States: Guide and Map:** Handy map of the units of the National Park System. Includes a thumbnail reference chart showing whether there is an entrance fee to a given area and indicating the availability of NPS guided tours, various outdoor activities, living history programs, camping, campgrounds and lodging, and other facilities. GPO Stock #024-005-00696-6. \$.70.

✓ **Index of the National Park System:** Divides the more than 300 units of the National Park System into natural, historical, and recreational areas and for each area gives a brief description of outstanding natural characteristics and history and the su-

perintendent's address. 1977 edition. GPO Stock #024-005-00689-3. \$2.30.

✓ **Doorway to Adventure: Visit a Lesser Used Park:** Features, services, facilities of 132 lesser known park areas offering exciting vacations. GPO Stock #024-005-00589-7. \$.70.

✓ **"Right Around Home" in the Southwest:** A special informational program for potential visitors to parks in the Southwest. Especially designed to help those who live in the region to try a vacation near home, visit lesser used areas, experiment with off-season vacations, and learn more about parks before they leave home. The NPS Southwest Regional Office has identified

park attractions within a 300-mile radius of each of fourteen groupings of population centers. Free "trip planners" geared to each particular population area feature a map and brief description of parks. For more information about specific parks, you can then request a free "visit planner" for any of the thirty-three park units in the Southwest. National Park Service, P.O. Box 728, Room T-100, Santa Fe, NM 87501.

✓ **Access National Parks, A Guide for Handicapped Visitors:** Describes facilities at NPS areas for blind and deaf persons, those confined to wheelchairs, and other handicapped persons. 1978 edition: GPO Stock #024-005-00691-5. \$3.50.

Be Camp in the Wilds

✓ **Camping in the National Park System:** Information on camping facilities, fees, camping seasons, limits of stay, reservations, and recreational opportunities available to campers in 100 NPS areas in 1979. Includes both the more developed campgrounds and group camps and backcountry camping. GPO Stock #024-005-00753-9. \$1.40.

✓ **Permits for backcountry camping:** Permits are required in many National Park Service areas this year; areas with heavy backcountry visitation are listed below. The system is designed to protect fragile backcountry areas and provide solitude. Most areas issue permits on a first-come, first-served basis; when one area is closed, backpackers usually will find that another area in the same park is available. However, to avoid disappointment write for more information ahead of time. Parks indicated by an asterisk (*) will accept advance reservations and should be written immediately for specific details.

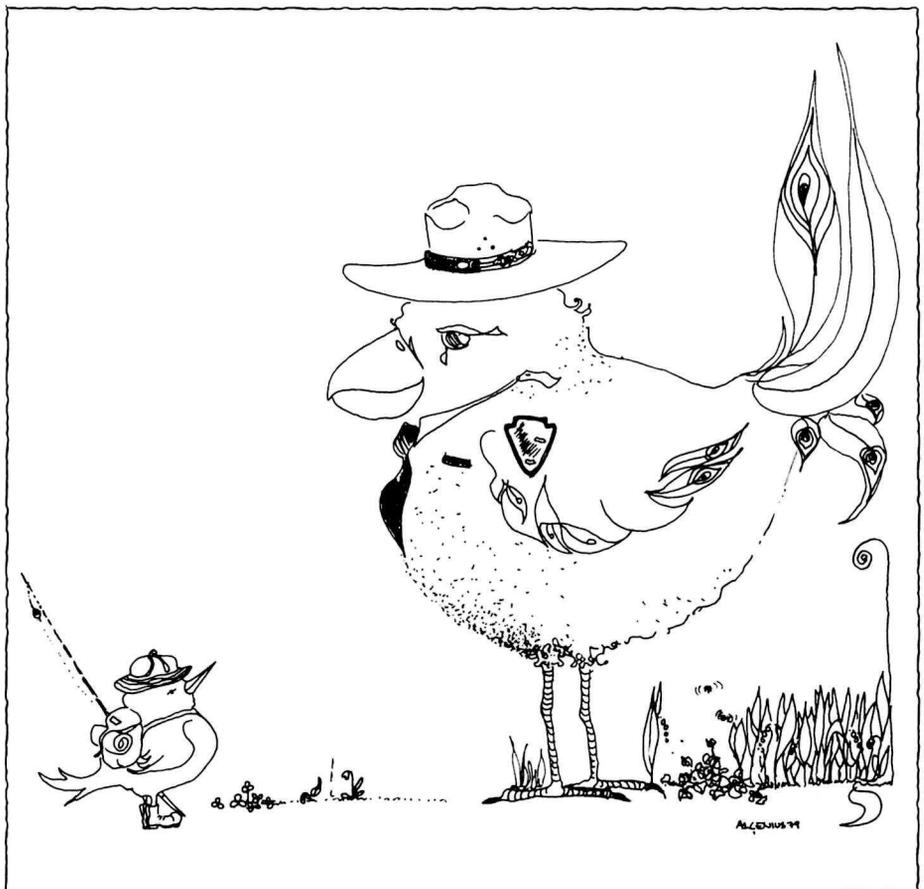
Apostle Islands National Lakeshore, Bayfield, WI 54814

Arches National Park, Moab, UT 84532
Assateague Island National Seashore, Berlin, MD 21811

Bandelier National Monument, Los Alamos, NM 87544

Big Bend National Park, TX 79834

Big Thicket National Preserve, P.O. Box 7408, Beaumont, TX 77706



MORE 

Blue Ridge National Parkway, 700 Northwestern Bank Building, Asheville, NC 28807

Bryce Canyon National Park, Bryce Canyon, UT 84717

Canyonlands National Park, Moab, UT 84532

Capitol Reef National Park, Torrey, UT 84775

Carlsbad Caverns National Park, 3225 National Parks Hwy., Carlsbad, NM 88220

Cedar Breaks National Monument, P.O. Box 749, Cedar City, UT 84720

Chaco Canyon National Monument, Star Route 4, Bloomfield, NM 87413

Colorado National Monument, Fruita, CO 81521

Crater Lake National Park, P.O. Box 7, Crater Lake, OR 97604

*Cumberland Gap National Historical Park, Middlesboro, KY 40965

Cumberland Island National Seashore Delaware Water Gap National Recreation Area, Bushkill, PA 18324

Everglades National Park, Box 279, Homestead, FL 33030

Glacier National Park, West Glacier, MT 59936

Grand Canyon National Park, Box 129, Grand Canyon, AZ 86023

Grand Portage National Monument, Box 666, Grand Marais, MN 55604

*Grand Teton National Park, Box 67, Moose, WY 83012

Great Smoky Mountains National Park, Gatlinburg, TN 37738

Guadalupe Mountains National Park, 3225 National Parks Hwy., Carlsbad, NM 88220

Haleakala National Park, Makawao, Maui, HI 96768

Isle Royale National Park, 87 North Ripley St., Houghton, MI 49931

Katmai National Monument, Box 7, King Salmon, AK 99613

Lassen Volcanic National Park, Mineral, CA 96063

Mount McKinley National Park, Box 9, McKinley Park, AK 99755

Mount Rainier National Park, Longmire, WA 98397

*North Cascades National Park, Sedro Woolley, WA 98284

Olympic National Park, 600 East Park Ave., Port Angeles, WA 98362

Petrified Forest National Park, AZ 86025

Pictured Rocks National Lakeshore, Munising, MI 49862

*Point Reyes National Seashore, Point Reyes, CA 94956

*Rocky Mountain National Park, Estes Park, CO 80517

Saguaro National Monument, Box 17210, Tucson, AZ 85713

Saint Croix National Scenic Riverway, P.O. Box 579, St. Croix Falls, WI 54024

*Sequoia-Kings Canyon National Parks, Three Rivers, CA 93271

*Shenandoah National Park, Luray, VA 22835

Theodore Roosevelt National Memorial Park, Medora, ND 58645

Whiskeytown National Recreation Area, Box 188, Whiskeytown, CA 96095

Yellowstone National Park, WY 82190

*Yosemite National Park, CA 95389

Zion National Park, Springdale, UT 84767

For more information on regulations, use limitations, and permits, write the superintendent of the park of your choice or the Division of Natural Resources, NPS, Washington, D.C. 20240.

➤ **Reservations:** Advance reservations for campsites that can be reached by automobile will be available this year at Yosemite and Sequoia-Kings Canyon National Parks in California, Grand Canyon National Park in Arizona, Acadia National Park in Maine, and Chickasaw National Recreation Area in Oklahoma.

In addition, several other parks will require advance reservations for backcountry campsites and group camps. Write to superintendents for information.

In a separate action, Mount McKinley National Park in Alaska has changed its campground management from a reservation system to a first-come, first-served basis for 1979.

NPS has signed a one-year contract with Ticketron, a company with reservation outlets nationwide, to provide the reservation service covering approximately 1,300 campsites at the three parks in the far West. Reservations may be made in person at Ticketron outlets in California or forms can be picked up at any U.S. outlet and mailed to the Ticketron Reservation Office, P.O. Box 2715, San Francisco, Calif. 94126. Reservations cannot be made by phone.

Reservations may be made up to eight weeks in advance, for the period between the Memorial Day and Labor Day weekends. Mail orders must be received in Ticketron's San Francisco office at least two weeks in advance.

Reservations also may be made in person through computer terminals at the three parks concerned.

Noncomputerized reservation systems will be operated by Acadia and Chickasaw. Persons desiring campsites at these locations should write to the individual park.

✋ *Make an Entrance*

✓ In 1979, 67 National Park System units (out of more than 300) are charging **entrance fees** ranging from 50 cents to \$3 per person, and some areas also charge **recreation use fees** of up to \$4.

✓ **1979 Golden Eagle Passport:** For persons under sixty-two years of age. Good for one calendar year. Costs \$10 and admits the purchaser and all persons traveling with him (or her) in a private, noncommercial vehicle to all designated federal entrance fee areas at no charge. Does *not* cover recreation use fees such as camping fees.

✓ **Golden Age Passport:** Good for lifetime the permittee. Free to citizens or permanent U.S. residents who are sixty-two years of age or older. Provides the same admission privileges as the Golden Eagle Passport, and also provides a 50 percent discount on camping and other recreation use fees and services. Apply in person.

✓ Both passports may be obtained at the designated fee areas. A list of federal entrance fee areas and other offices where you can obtain the passport is free from the Park Service, Interior Department, Washington, D.C. 20240.

✋ *Be Cozy Inside*

Check with the park superintendent or the local Chamber of Commerce for information on comfortable accommodations operated by local business enterprises in locations convenient to the park of your choice. In many National Park System areas, private concessioners provide food and lodging within the park. The Park Service offers a booklet on these concessions: *Visitor Accommodations* is available free from the Office of Public Inquiries, National Park Service, Washington, D.C. 20240.

✋ *Play It Safe*

✓ **Outdoor Safety Tips:** Waterproof guide with general tips on survival, safety, and first aid. Useful to people using national forests, parks, and other areas. GPO Stock #001-000-03427-8. \$35.

✓ In addition, be sure to ask park personnel about particular hazards at the area(s) you plan to visit.

✋ *More Tips*

For additional information on national parks, write the superintendent of the park of your choice or the Office of Public Inquiries, National Park Service, Washington, D.C. 20240.

reader comment

HCRS Promises Brighter Future for Landmarks

I was pleased to read in the March issue of *National Parks & Conservation Magazine* of NPCA's continuing concern for the threatened National Natural and National Historic Landmarks and wish to thank you for publishing the lists in the interest of their protection. The adequacy of the protection afforded the nationally significant natural resources is of major concern to the Heritage Conservation and Recreation Service (HCRS).

Your article quite correctly points out that the National Landmarks Program has not received the attention within the Service that it needs and deserves. I take full responsibility for this past lack of attention. Measures have been undertaken at my direction which will insure that the National Landmarks Program will receive high priority in future activities of the Service.

The National Natural Landmarks Program has long been understaffed and underfunded. I have increased the size of the staff directly supporting the technical activities of this program and fully involved the Service's eight field offices in monitoring the integrity and welfare of the landmarks. In addition, our fiscal year 1979 budget of \$731,000 for natural landmarks coupled with our requested \$755,000 for fiscal year 1980 should provide adequate funding to support the program.

On recognizing that the regional studies of natural resources were fast building a collection of potential landmarks—some 1,700 by the end of fiscal year 1978—I initiated in January of this year a streamlined landmark review

and designation process. In addition to decentralizing the review of potential landmarks to our eight field offices, I also authorized the use of eminent ecologists and geologists from outside the Service to participate in landmark evaluations and nominations. By letter of March 21, 1979, I informed the substantive congressional committees on the approach I was taking and set a deadline of August 31, 1979, to complete the initial screening of the 1,700 potential sites. I am personally committed to achieving this stringent goal.

I hope you will agree that we have taken major steps to place the National Landmarks Programs squarely in the mainstream of the Service's activities. We join with you in encouraging participation by your members and others in the monitoring and protection of the threatened Natural and Historic Landmarks. We're glad to have your support.

Chris Therral Delaporte
Director

Heritage Conservation and Recreation Service

U.S. Department of the Interior

Although we are highly pleased with the renewed attention being given landmarks by HCRS, we are concerned about the unrevealed "new criteria" for judging national significance and thus are not making any final judgments about the program now.

Cape Cod Threatened

Your excellent March 1979 article on the NPCA adjacent lands survey could be expanded to consider threats to parks from *within* their borders. Specifically, you could study the Cape Cod National Seashore.

Continuation of existing private use was contemplated when the seashore was created. Only minor modifications to existing dwellings were to be allowed, however.

Several years ago, a local Cape paper, *The Cape Codder*, disclosed the scandalous extent of conversions of "shacks" to "mansions" (and variations) that had been taking place. In response, senators and the local congressman promised to introduce legis-

lation to correct any deficiencies in the law, and to appropriate enough money to enable the NPS to better monitor private land use.

Despite the hue and cry, major modifications continue. Small cottages on the shore of a pond, for example, have become huge modern dwellings—completely changing the appearance of the pond, a major public area *within the park*.

I think this continuing private intrusion into the public area deserves NPCA's attention. It is especially important because many millions of urban dwellers will never visit any other national park.

Robert Dinerstein
Park Forest, Illinois

NPCA is concerned about all threats to NPS units and greatly appreciates receiving information such as the above about them. Previous articles have covered threats from within parks. (For instance, see page 24 of this issue for an article on inholdings in Olympic National Park.)



IMMORTAL MAPLE

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Grand Teton—from page 26

Long opposed by NPCA as an intrusive and incompatible development in scenic Jackson Hole Valley, the facility is the only full-fledged airport within a park. The airport's license expires in 1993, but local interests are trying to expand and entrench the facility in its present location. EPA recently reinforced its earlier call for consideration of removing the airport from the park by roundly criticizing a Federal Aviation Agency environmental impact statement for its "misleading" assessment of noise impacts and failure to adequately examine either mitigating measures or alternatives such as relocating commercial air service to Idaho Falls, Idaho; development of a better public ground transportation system; and development of a suitable general aviation airport near Jackson. At press time the Park Service was expected to make a recommendation about the airport's future to the Secretary of Interior at any time. ■

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MINING IN PARKS

NPS Forced to Allow Uranium Surveys in Parks

Under a recent Freedom of Information request, NPCA has learned that the uranium exploration activities conducted in a number of national parks last summer occurred over the objections of park officials.

In an overzealous attempt to leave no stone unturned in its quest for energy, the Department of Energy apparently forced the National Park Service to allow surveyors into parks ranging from Death Valley to Shenandoah.

Moreover, the surveys conducted were more extensive and greater in number than originally contemplated by the Park Service. NPCA's Freedom of Information investigation shows that misunderstandings and confusion resulted at the park level. As one park official noted, collecting of rock samples, other sampling techniques, and low-level aerial tests over the parks "appear to be in conflict with

park purposes"—particularly when one considers that parklands are closed to mineral entry and thus are supposed to be closed to prospecting and exploratory activities. ■

LASSEN

Geothermal Go-Ahead

Another recent energy-related incursion into national parks was geothermal drilling within Lassen Volcanic National Park in California. Phillips Petroleum did the drilling and constructed a road on a private inholding within the park. Although the land does not belong to the Park Service, the agency could have stopped the development. In fact, the Park Service had in its possession an approved "declaration-in-taking" that would have enabled it to condemn the land to prevent the drilling and roadbuilding. NPCA has protested the fact that the Park Service failed to do so. ■

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Continued from page 2

The story of the solar cell has been related lucidly as part of a penetrating analysis of the whole energy problem by Barry Commoner in *The New Yorker* for April 23, 1979.

To place emphasis on the solar cell is not to disparage other methods of generating energy from sunlight. The residential and office use of sunlight for heating and cooling could be expanded by incentives provided by HUD and IRS. And there are possibilities for mirrors and lenses focusing heat on boilers. Dark days, night, and winter can be compensated for by various methods of storage. But the photovoltaic cell offers a rather clearly demonstrable breakthrough on which our attention as a nation should be concentrated now.

THE DYNAMICS and cost-benefit ratios of big-turbine wind power were worked out by Percy H. Thomas for the Federal Power Commission more than 30 years ago. We knew at that early date that batteries of giant windmills, with 200-foot wheels, could generate electricity in proper places at feasible costs. But the big hydro-power dams held sway at that time; after the War, it was oil, and then the dangerous toy of nuclear reactors.

Big wind power needs to be fitted into a new national energy plan; the locations would be in the high-wind regions of the North Atlantic and the Great Plains. There is reason to believe that the capital investment would be lower than has been considered acceptable for nuclear generation; we cannot afford to follow both investment courses at once, and so the crucial choice will have to be made now. By devoting part of the capacity to the production of hydrogen by electrolysis, for use as a fuel, compensation can be made for windless days.

Ocean thermal energy conversion (OTEC) must also have its place, and a large one, in a new national energy plan. Here again, we are dealing with large installations, located preferably off our South Atlantic coast or in the Gulf of Mexico. The interaction of cold water from the ocean depths with the warm water at the surface generates power without fuels and without waste or pollution. Again the capital costs will probably be lower than for nuclear installations; but the investments in either will be so great that a choice must be made. The problem was analyzed clearly by Clarence Zener in the *Bulletin of the*

Atomic Scientists in January 1976. How long must we wait for action?

THERE ARE many possibilities in the use of biomass: the production of methane from the wastes of agriculture and lumbering and the sludge from treatment plants; the use of agricultural crops such as corn to make alcohol for mixing with gasoline to produce gasohol, which may even now be practical for automobiles.

We have had our doubts about energy systems based on combustion, because of the well-known problem of the accumulation of carbon dioxide in the atmosphere and the possible overheating of the planet. Hydrogen, which could be produced at solar, wind, or hydropower plants, burns cleanly to water and makes a good transportation fuel.

Advocates of the alternatives have often, and properly, stressed their advantages for decentralization. A dispersion of solar or wind facilities across wide areas might help to reduce residential and industrial concentration. But this is at present an urban-industrial economy; power plants feeding into the existing industrial structure and transportation networks will be needed for a long time.

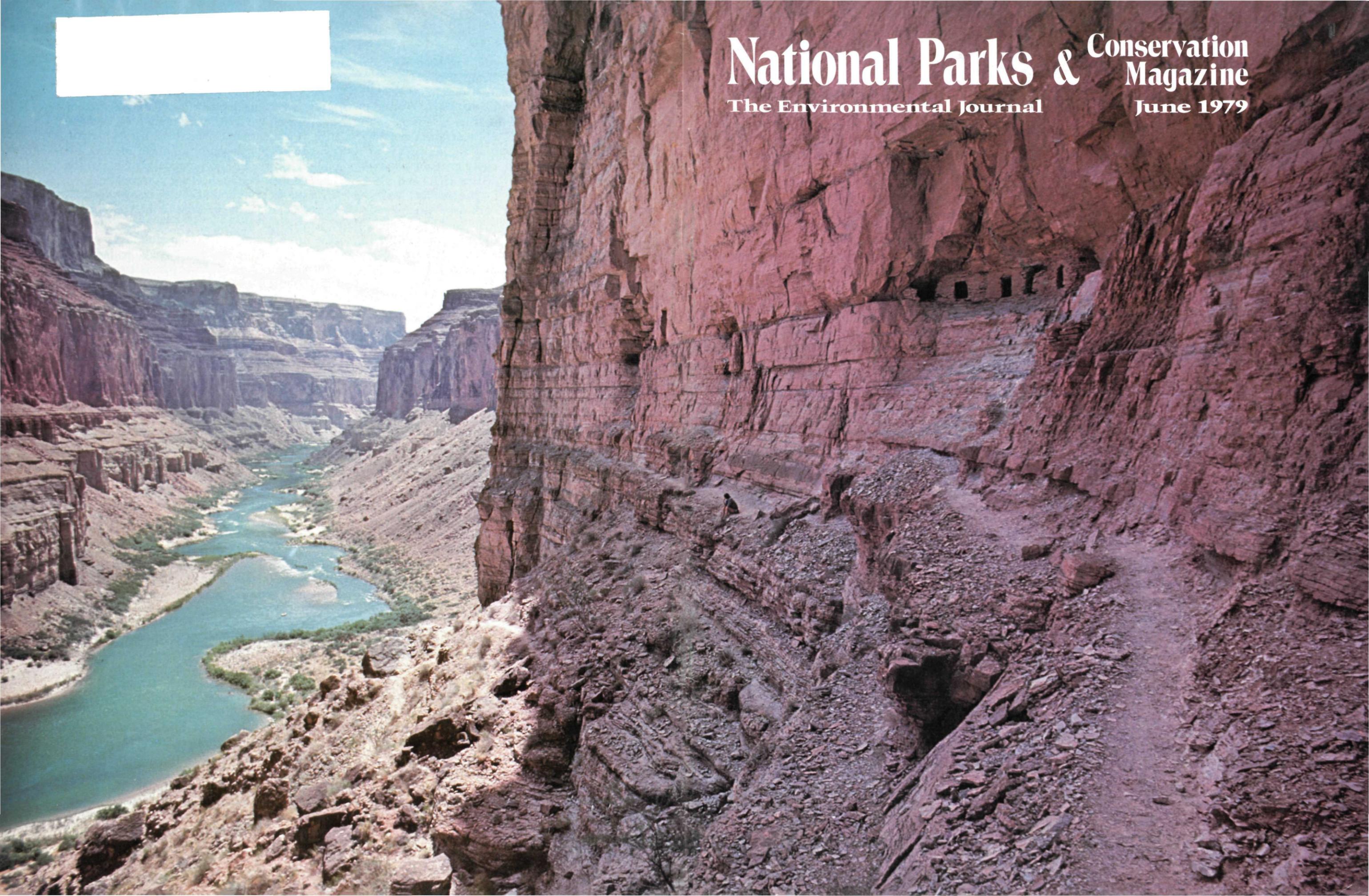
THERE ARE many promising approaches; to stress but a few is to call attention to a larger array. And there can be no question that a well-organized, multipronged attack on the conservation of energy would produce spectacular returns.

We note as useful references, *The Unfinished Agenda*, Rockefeller Brothers Fund, January 1977, and *An Emergency Energy Program* by Emile Benoit and David F. Mayer, 1978, reprinted in part by NPCA.

At stake are the public safety against radioactive hazards; the protection of the environment against air pollution and strip mining associated with coal-fired plants; the protection of the atmosphere of the planet against overheating from expanded coal and gas utilization; the health of the people of our cities who are condemned to the carcinogenic fumes of gasoline-fueled automobiles; the stabilization of the economy, as against a ruinous inflation induced in part by reliance on depleting fossil fuel resources; and the economic and military security of the United States, imperiled at present by our dependence on the OPEC nations.

—Anthony Wayne Smith



The image is a cover for a magazine. The background is a photograph of a deep canyon. On the right side, there is a massive, layered rock wall. In the distance, a river flows through the canyon. The sky is blue with some clouds. In the top left corner, there is a white rectangular box. In the top right corner, there is text in white.

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