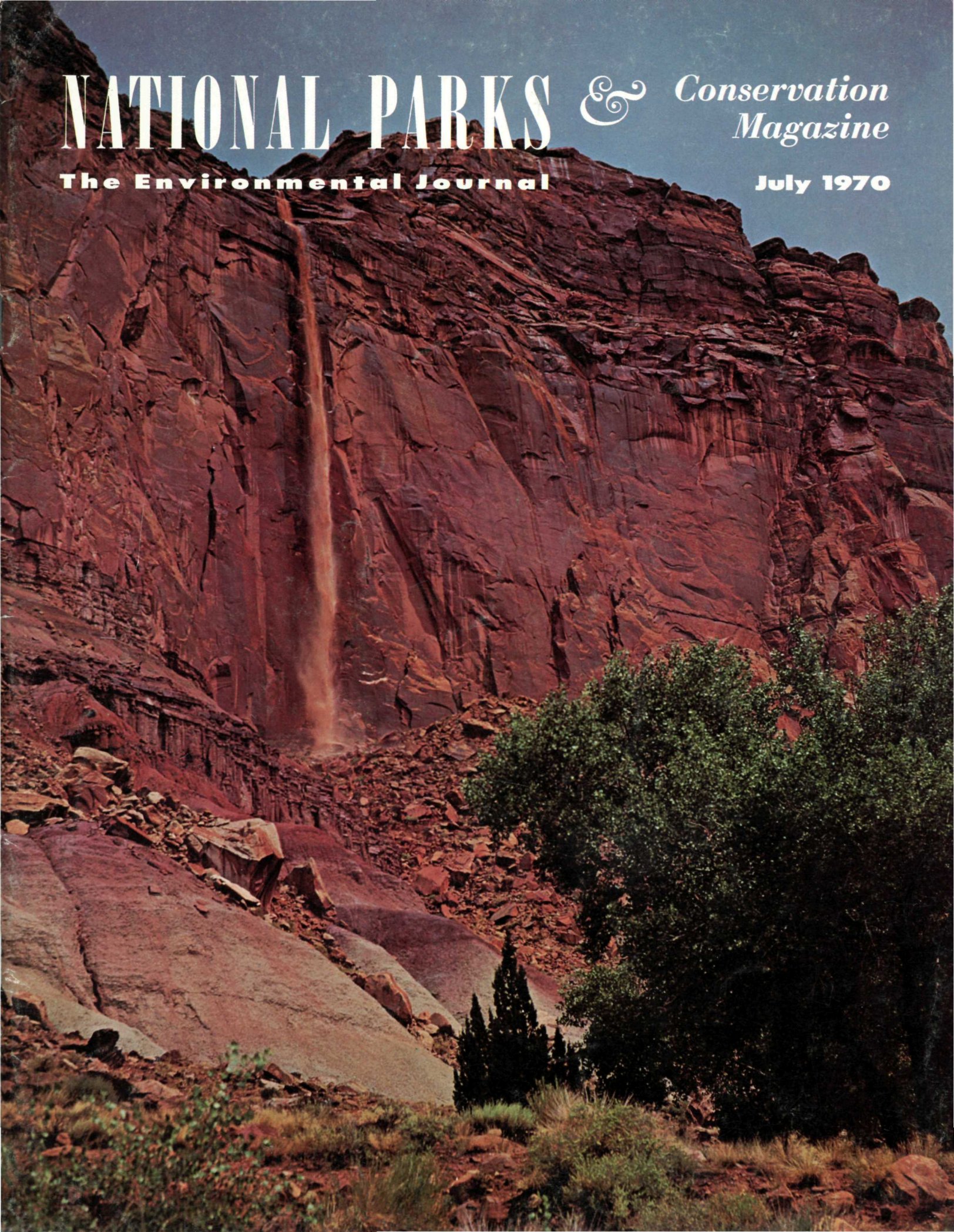

NATIONAL PARKS & Conservation Magazine

The Environmental Journal

July 1970

EPO

Life on the Plundered Planet has been sinking ever more deeply into social, economic, military, and environmental trouble. Can the United Nations Conference on the Human Environment in Stockholm in 1972 offer hope for a reversal of the deadly environmental trends, faith in the possibility of a world community committed to life, not death?

We have urged that the United States take the lead at the Conference in calling for an Environmental and Population Organization of the United Nations, open to members and nonmembers alike, as necessary for any realistic action to rescue life on this beleaguered globe.

Job No. 1 for an EPO would be to tackle worldwide oceanic and atmospheric pollution. Inter-governmental action is essential to halt the global use of persistent wide-spectrum pesticides, substituting nonpersistent narrow-spectrum pesticides at first, and biological controls as rapidly as possible.

The pollution of the seas by oil, with all its disastrous biological consequences, must be stopped. Attention must be given to contamination by radioactive wastes, and resolute action taken to halt it. Pollution of the atmosphere is a planetary issue; carbon dioxide emissions and the release of light-obscuring particulates into the atmosphere, to mention but two of many dangerous pollutants, must be brought under strong worldwide controls. Only an international agency, vested with considerable powers by its participating nations, and backed by strong action in the several countries, can accomplish anything significant in this vital field.

Job No. 2 is to substitute an Ecological Agriculture Program for the present well-meaning but self-defeating Green Revolution in combating the growing menace of planetary famine. The present program is based in part on the massive use of the more destructive pesticides and herbicides, carriers of cancer, lethal mutations, sterility, and extinction.

The Green Revolution can achieve a desirable short-cut to economic betterment, by-passing rapid industrialization for the present, but a fundamental modulation is imperative in respect to pesticides, herbicides, and even fertilizers. Such a modulation seems unlikely to issue from the Food and Agriculture Organization, FAO; the proposed EPO should work with FAO in establishing new directions.

Job No. 3 is to get over to ecological medicine. The great humanitarian efforts of recent decades in combating yellow fever, typhus, plague, malaria will come to nothing unless both pollution and proliferation can be brought under control. But the major problems of worldwide pollution, which threaten planetary ecological death, stem from the reckless or ignorant abuse of pesticides like DDT. Recent decades have brought the blessing of an abundance of curative and preventative medical techniques, methods of medication and immunization, and a rapid shift of technology toward these methods is imperative lest the poisoning of the world bring death, not life, to the patient. Great as the achievements of the World Health Organization, WHO, have been, an international agency with both environmental and medical responsibilities, capable of cooperating constructively with WHO, is now an international necessity.

Job No. 4 is the survival of species. Mankind came to life, it has been well said, only with all life; mankind will survive, if it survives, only with all life. Existence of the human species is rooted in the matrix of the planetary ecology. The restoration and protection of that ecology is a task to which the energies of a well-financed, well-staffed international agency, deploying inter-governmental resources, must be dedicated rapidly and for many decades until the world draws back from disaster. This work would be a primary charge upon EPO.

Job No. 5, which is in reality fundamental to all other efforts, would be to get a worldwide grip on the runaway population situation. Falling death rates and sustained birth rates everywhere have precipitated the very real danger that mankind may shortly breed itself into extinction and carry all other earthly life with it. Rising populations are defeating efforts to raise living standards above the famine and poverty levels. The problem is basically motivational: how to create a universal ethic of the two-child family. The scientists of human custom, whatever their specialties, must be mobilized worldwide for an immediate attack on this problem. An international agency, well-staffed and well-funded, is essential to this work.

Job No. 6 is one which was heavily stressed in the report of the Secretary-General on the proposed Conference in his announcement last year: the issue of urbanization. The plunge of human society into the vast urban conglomerates which now ring the globe has been helpless and blind. Driven from the land and the villages by over-crowding and poverty, workers have sought employment in cities which have closed upon them like steel traps.

No claims of cultural superiority or economic efficiency can justify these human anthills; the trend toward regional urbanization, on all the continents, must be reversed. Men must set their faces again toward life in a natural setting, in a world of open fields, pure streams, rolling forests, and settlements built to the human scale which can become true communities. Such goals imply long-range efforts, and a world agency needs to be working upon them.

The harried years since the founding of the United Nations, indeed since the League of Nations and before, have seen much patient effort, often little noticed, to elaborate international systems of covenants and agencies designed to cope with some of the problems created by the expanding planetary economy and technology. A wide range of legal and governmental techniques has been explored: international agreements, regulations adopted pursuant to agreed procedures, inter-governmental administrative agencies, regulatory commissions, and quasi-judicial and even judicial tribunals.

Much admirable work has been done in the realms of arms control, human rights, technical assistance, and economic aid, comprising a growth of international law which foreshadows worldwide representative government.

It is possible that efforts to rescue the world ecology, of which mankind is an inseparable part, may result in major breakthroughs in international law of a kind which has been difficult to achieve in the other endeavors. The restoration of a natural, secure, and uncrowded world environment might become a rallying cry, moving the nations toward peace, the moral equivalent of war.

The EPO project, or one essentially like it, should now become a focal effort of environmentalists the world over. As individual citizens and private organizations decide in such matters, so eventually will the world move. —*A. W. S.*

In keeping with its policy of many years standing of concentration on the National Park System, but concern with all conservation and environmental issues, the National Parks Association modified its name at the Annual Meeting of the Corporation and Trustees on May 22, 1970, to the National Parks and Conservation Association. The altered name reflects the long-established nature of the work of the Association more clearly, and does not change the purposes of the Association.

National Parks & Conservation Magazine is published monthly. Contributed manuscripts and photographs are welcome. They should be addressed to the Editor at Association headquarters and should be accompanied by a stamped, self-addressed envelope. No responsibility can be assumed for unsolicited material. As an organization receiving tax-exempt contributions, gifts, and bequests, the Association is precluded by law from advocating or opposing legislation to any substantial extent. Insofar as authors of articles published in this magazine may touch on legislation, they write as individuals.

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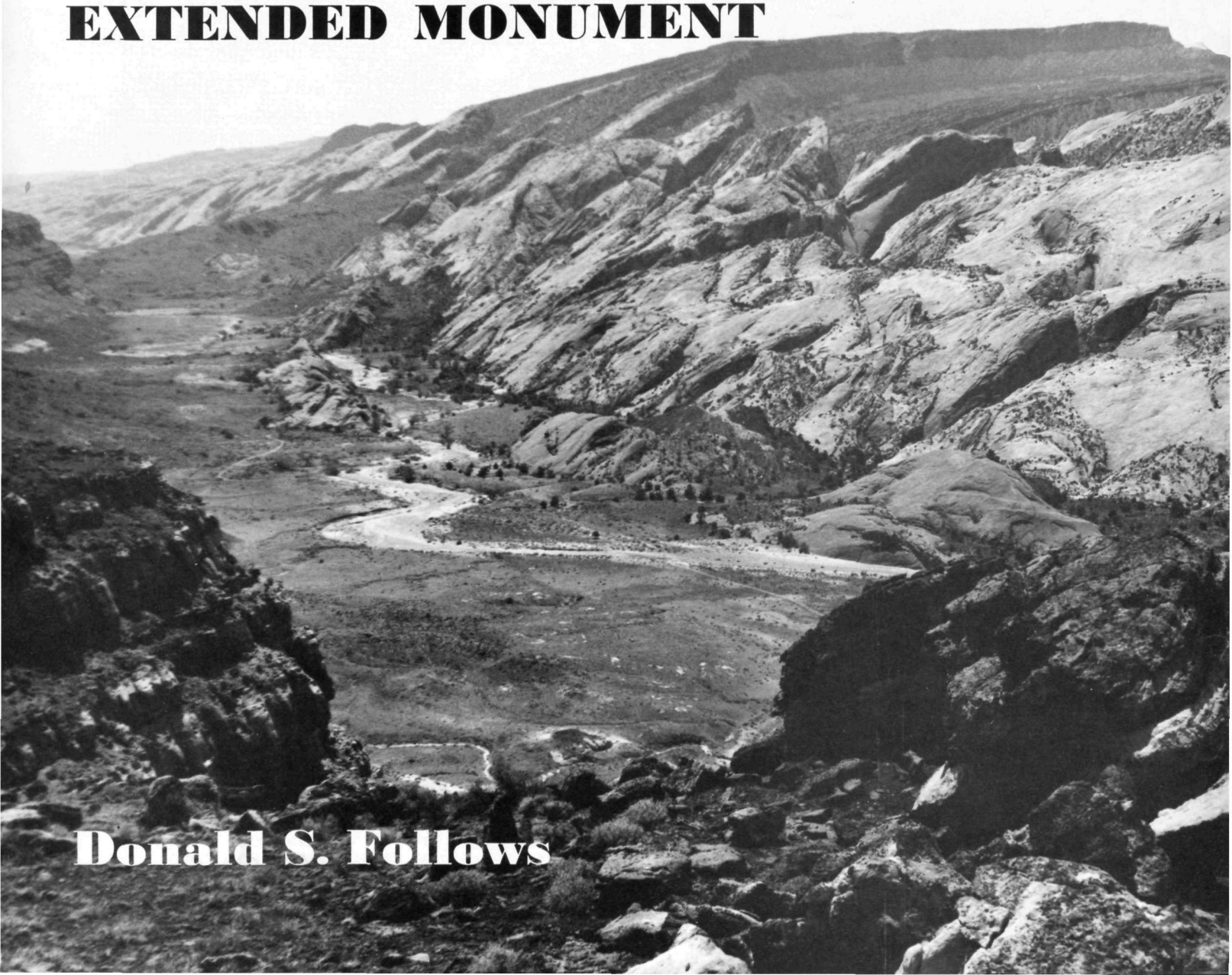
COVER *"Waterfall Over the Wingate" by Donald S. Follows*

The 320-feet-thick layer of Wingate Sandstone—intricately cross-bedded as ancient winds formed dunes first in one direction then in another, later buried and packed hard under thousands of feet of sediment, and finally exposed by eons of erosion—now forms the massive red cliff faces in the Escarpment Section of Capitol Reef National Monument in southern Utah. What is now called the Escarpment Section originally comprised the entire Capitol Reef Monument; but in January 1969 the monument was greatly enlarged to include the whole Waterpocket Fold, a gigantic monocline 70 miles long, finally giving the monument geological unity (page 4).

National Parks & Conservation Association, established in 1919 by Stephen Mather, the first Director of the National Park Service, is an independent, private, nonprofit, public-service organization, educational and scientific in character. Its responsibilities relate primarily to protecting the national parks and monuments of America, in which it endeavors to cooperate with the National Park Service while functioning as a constructive critic, and to protecting and restoring the whole environment. Life memberships are $500. Annual membership dues, including subscription to National Parks & Conservation Magazine, are: $80 sustaining, $40 supporting, $12 contributing, and $8 associate. Student memberships are $6.50. Single copies are 75¢. Contributions and bequests are needed to carry on our work. Dues in excess of $8 and contributions are deductible from federal taxable income, and gifts and bequests are deductible for federal gift and estate tax purposes. Mail membership dues, correspondence concerning subscriptions or changes of address, and postmaster notices or undeliverable copies to Association headquarters in Washington. When changing address, please allow six weeks' advance notice and include old address (send address label from latest issue) along with new address. Advertising rates and circulation data are available on request from the Advertising Manager in Washington.

The colors are such as no pigments can portray. They are deep, rich and variegated; and so luminous are they, that light seems to flow or shine out of the rock rather than to be reflected from it. ***—C. E. Dutton, 1880***

CAPITOL REEF
EXTENDED MONUMENT



Donald S. Follows

That is the way an earlier American geologist recorded his impressions as he gazed upon the tilted cliffs and rainbow rock layers of a strange and little-known land in south-central Utah. John C. Frémont's fifth expedition had passed through the vicinity nearly 30 years before; yet the words of the U.S. Geological Survey's able Clarence E. Dutton were the first to paint the vivid character of the region to be called the Waterpocket.

From atop Thousand Lake Mountain, Dutton could see only a small part of the long bulge in the earth's surface—the Waterpocket Fold—which was of such grand proportions that it would, in later years, recommend itself to public ownership and protection as a unit in a national park system whose basic philosophy was already beginning to crystalize.

Geologists refer to the earth structure called the Waterpocket Fold as a "monocline." In nonscientific terms, a monocline is a single fold or flexure in the earth's surface; this particular monocline runs for a hundred miles or so in a nearly north-south direction through southern Utah. The Waterpocket is truly of national significance, for it is probably the finest and most readily apparent phenomenon of its sort in America. Its geological story is punctuated with bright chapter headings that can be read along three scenic sections of the Fold—a story that tells of sedimentation, compaction, uplift, vulcanism, glaciation, and wide-scale erosion over vast periods of time. And the region in which it is set contains some of the most exquisite high desert scenery in the West. As a great scenic and geologic spectacle well deserving the care of the National Park Service, Capitol Reef National Monument was established for the American people in 1937.

In January of 1969 the monument was enlarged by presidential proclamation to include a further 215,000 acres along the classic Waterpocket Fold, defining a narrow strip of colorful rock layers almost 70 miles long and lending the monument a sense of geological unity it had never possessed before.

Like many of the units that finally qualify for inclusion in our national park system, Capitol Reef has seen its share of attempted exploitation. For example, thousands of uranium prospectors poured into the region during the brief boom of the 1950's. In a rare exception to national policy, Capitol Reef was even opened up for uranium exploration and production; but after a 10-year period in which no profitable ore materialized, the monument closed its doors to the promoters.

Hard on the heels of uranium prospectors came petroleum interests, proclaiming that the Waterpocket Fold seemed to be a natural structure for oil. Fortunately for the Fold and its admirers, drilling ventures along the structure produced nothing but "dry" holes. If oil had ever been present, it had presumably migrated elsewhere. All in all, perhaps it was inevitable, with the development of roads in the region, that another sort of use would be proposed for the entire Waterpocket in which all Americans could share—protection as a national monument. In terms of esthetic, scientific, or even economic wealth, the Waterpocket Fold will be more productive than all of its real or fancied uranium and oil.

Like a Great Wall of China, the Fold imposes its own geographical isolation. Only three perennial streams cut across its barrier wall; other canyons simply die in their upper reaches. The sharp edge of necessity gave the Waterpocket a name. Waterpockets are shallow depressions eroded from some of the sandstones of the Southwest, which collect rainwater and hold it over fairly long periods as a boon to man and animal alike. The pockets are also called "pot holes" or "tanks"; but whatever one chooses to call them, they are treasures in a land of scorching sun and thirsty air.

The three scenic sections along the Fold have so much of interest to offer that at first one might think that there is in the whole no unity of theme; but the great monocline finally links all together. Each section has its own important story to tell about the genesis of the region, so perhaps we might take a trip from north to south and think of the three divisions as the Cathedral Section, the Escarpment Section, and the Monocline Section.

THE CATHEDRAL SECTION A three-part drainage system of deep troughs and hogback ridges parallels the northeast exposure of the Fold, a pattern created in Ice Age times by the outwash of alpine glaciation originating on Thousand Lake Mountain—a name stemming from the multitude of lakes that must have existed during the melting of glacial ice on the mountain perhaps 10,000 years ago.

The South Desert, Hartnet Desert, and Middle Desert make up the three long troughs of the drainage. Middle Desert is farthest east, its upper portion being known as Cathedral Valley after the sandstone monoliths found there. The few dirt roads that exist in this Middle Desert section are suited only to four-wheel-drive vehicles. The cathedrals are 500-foot erosional remnants of Entrada Sandstone that rise like sharks' teeth from a flat desert floor; contrasted with their surroundings, the bright stone spires seem even larger than they are. This cathedral-making Entrada Sandstone is a fine-grained, reddish-brown rock of late Jurassic age, which means—if remote geological time means anything to humans—that it is more than 150 million years of age. Because the Entrada is relatively soft, it erodes rather rapidly except where a harder, younger formation over it acts like a shield to protect it from decay. Most of the cathedrals have lost their harder protective covering and stand exposed not far from the base of the mother escarpment. Their geological fate is a slow reduction to the level on which they stand.

The lower cathedral group occupies an area about the size of a modern shopping center; in it, four monoliths dominate the foreground. An amphitheatre of pillared cliffs forms a backdrop of color, a little reminiscent of Bryce Canyon National Park but in a setting in which the pinnacles have never been fully defined. Shadowed maroon and golden-brown colors play across the land to compliment the Temple of the Sun, Temple of the Moon, and two lesser cathedrals called the Temples of the Stars.

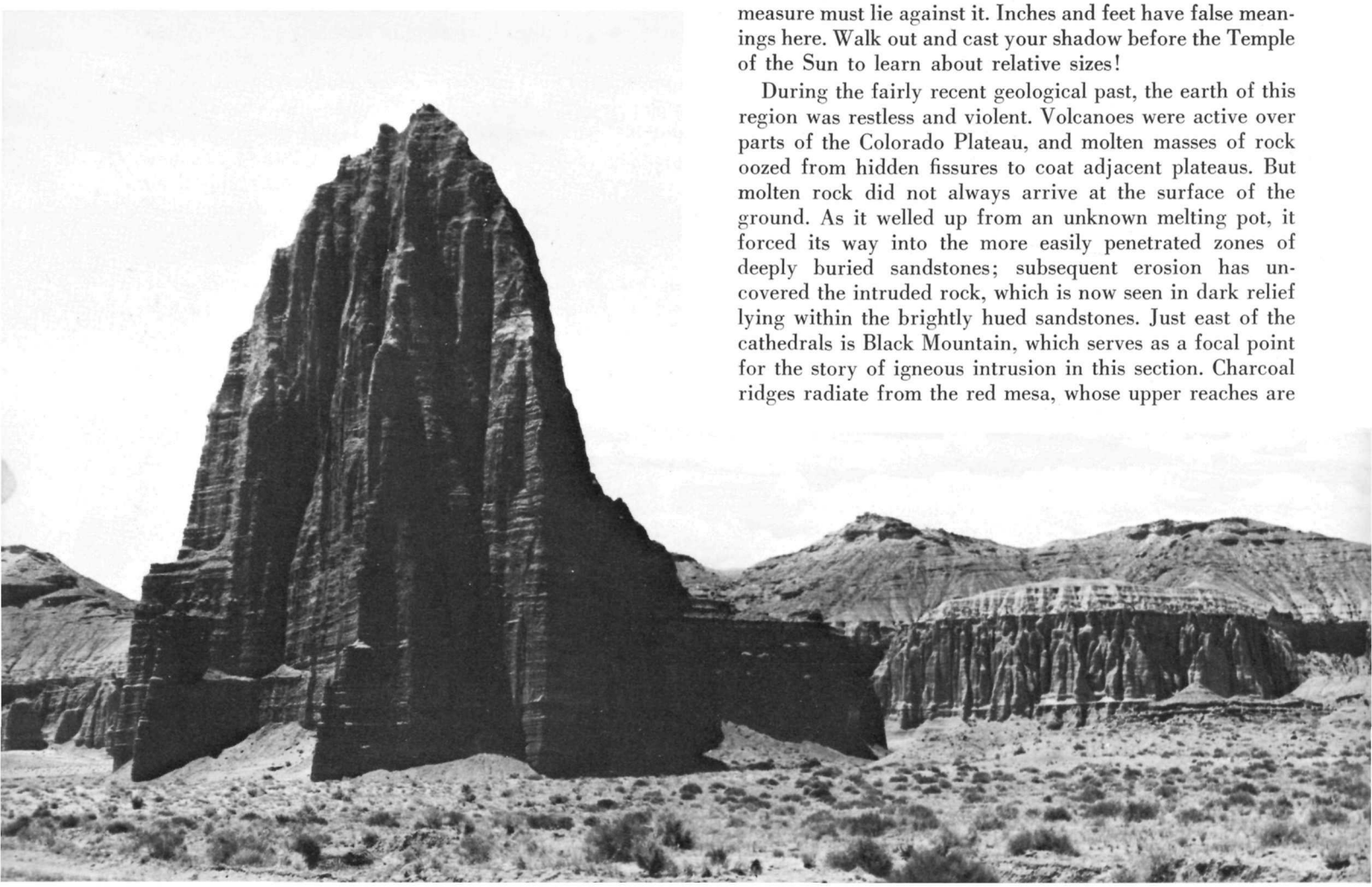
The flats to the east, commanded by stone monarchs, are as awesome as they are lonely. Dark ridges define the far horizon. Somewhere among the low-growing shrubs of the desert community an antelope ground squirrel darts toward shelter. The alkaline snowflakes that swell to the surface of the ground near dry washes compete for notice with glimmering gypsum crystals. Sand, sky, and cathedrals seem hostile to life in this nearly nonliving environment. To truly measure the immensity of a cathedral, man's own

PHOTOGRAPHS BY THE AUTHOR

"The Gulch" at the eastern edge of the Waterpocket Fold

measure must lie against it. Inches and feet have false meanings here. Walk out and cast your shadow before the Temple of the Sun to learn about relative sizes!

During the fairly recent geological past, the earth of this region was restless and violent. Volcanoes were active over parts of the Colorado Plateau, and molten masses of rock oozed from hidden fissures to coat adjacent plateaus. But molten rock did not always arrive at the surface of the ground. As it welled up from an unknown melting pot, it forced its way into the more easily penetrated zones of deeply buried sandstones; subsequent erosion has uncovered the intruded rock, which is now seen in dark relief lying within the brightly hued sandstones. Just east of the cathedrals is Black Mountain, which serves as a focal point for the story of igneous intrusion in this section. Charcoal ridges radiate from the red mesa, whose upper reaches are



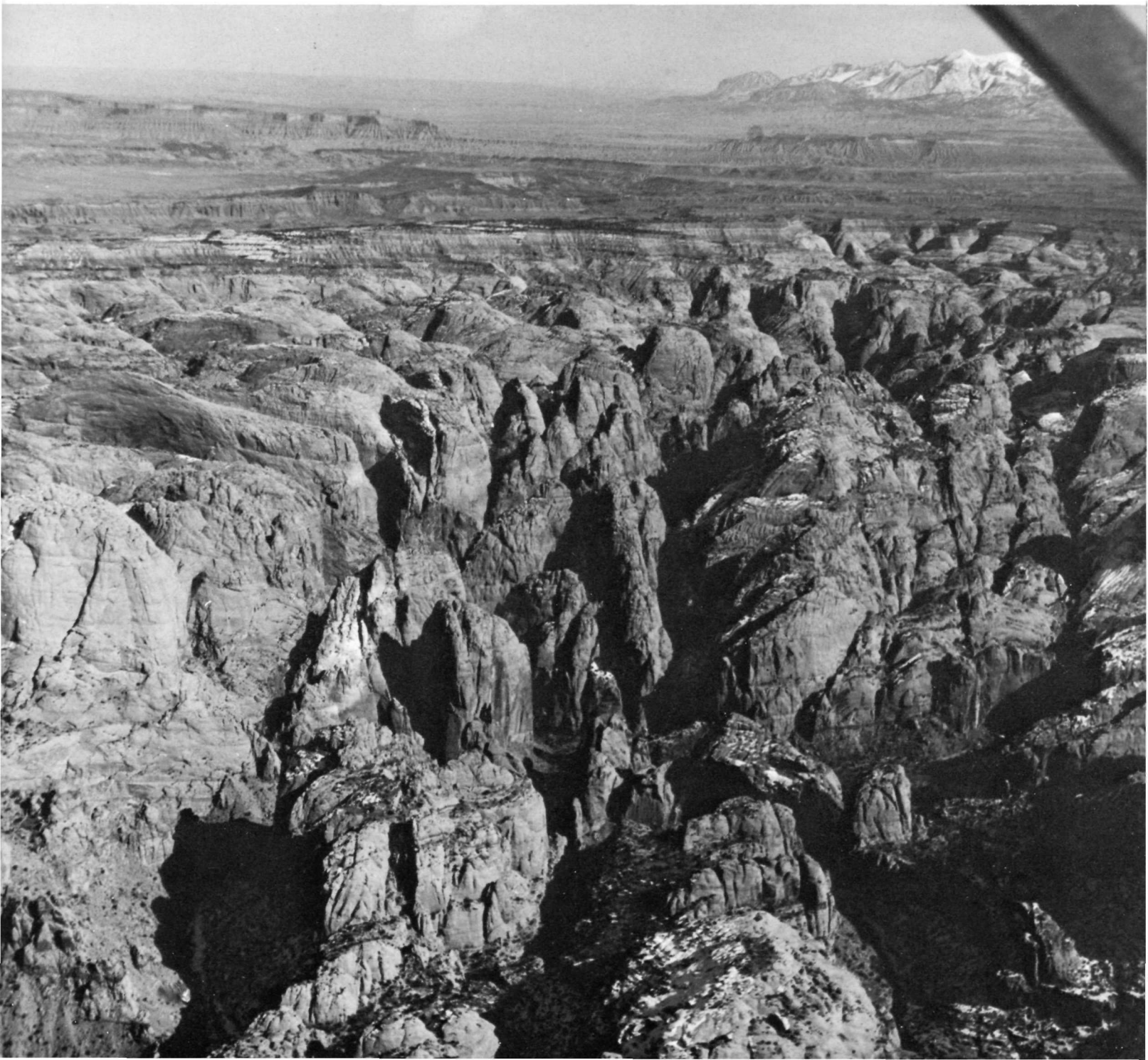
scored with dark basalt, long solidified into dikes and sills. The violence that went on during the development of the Fold is best told by the Black Mountain and cathedral areas.

THE ESCARPMENT SECTION The Escarpment Section occupies the original area of Capitol Reef Monument, where 20 miles of sun-soaked cliff tip back in magnificent color. Delicate pink and glimmering white coalesce across splattered walls of orange and ocher sandstone. A thousand feet above the Frémont River, domes of Navajo Sandstone seem bleached against the glow of underlying rocks. This is the home of the great Wingate Sandstone cliff as well, and its colorful counterparts whose rocks date back into the Middle Ages of geology.

But the Escarpment Section is more than a place where vermillion cliffs are etched against gentian skies. It has its

Donald S. Follows, Chief Park Naturalist at Bryce Canyon National Park, has served in five park service assignments in southern Utah. In 1965, Mr. Follows participated as a geologist-photographer on the Waterpocket Fold Natural Landmark Study. The ensuing report provided national significance to the Waterpocket country.

Opposite page, top: The Temple of the Sun is a 500-foot monolith that commands the Lower Cathedral Group. Opposite page, bottom: At the head of Cathedral Valley, Black Mountain displays dark layers that were injected as molten rock during Tertiary times and later cooled to form dikes and sills. Below: A flight over the heart of the Waterpocket Fold reveals the domes and towers of the upwarp. Many sections of Capitol Reef never have been fully explored.

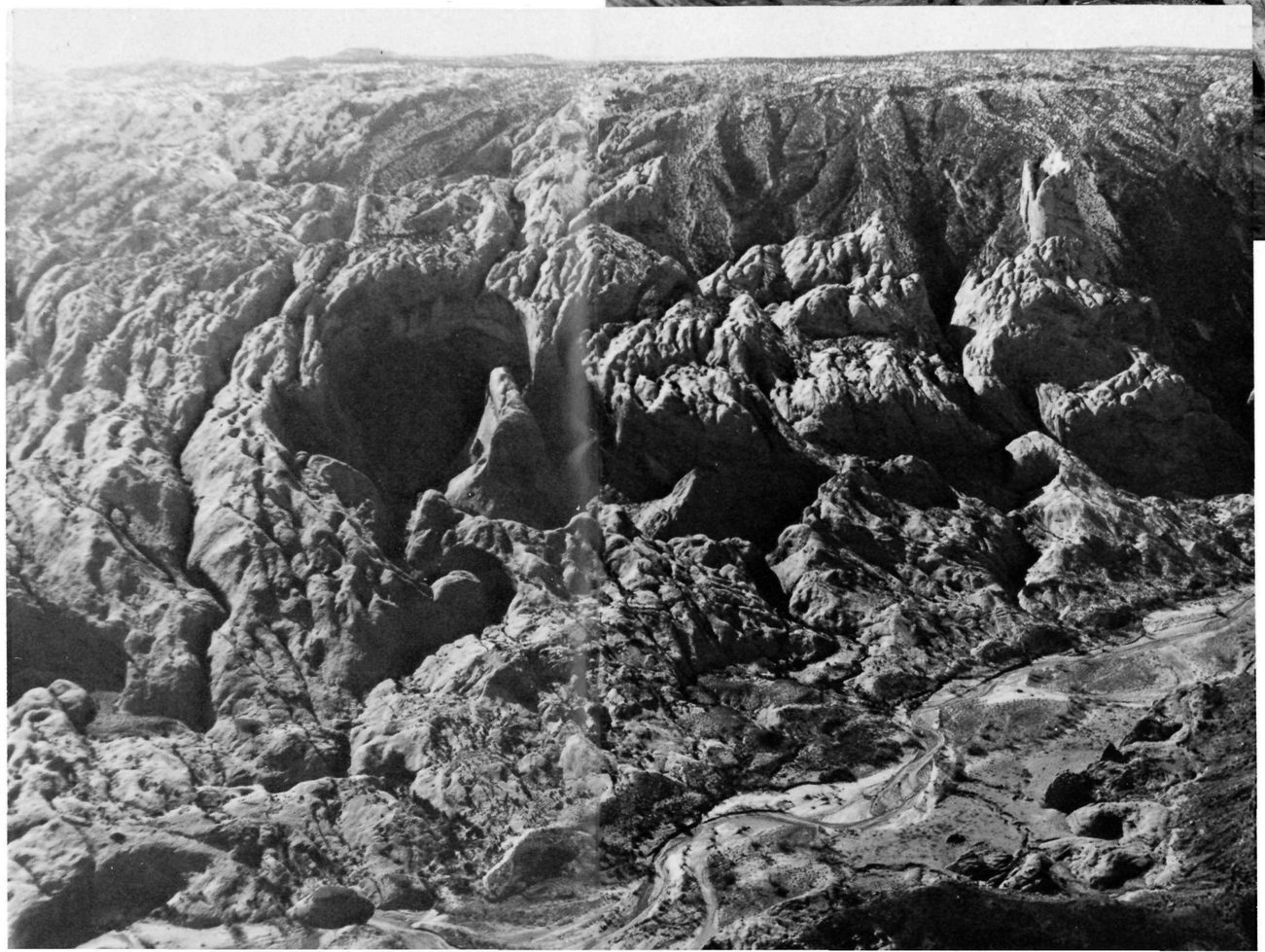


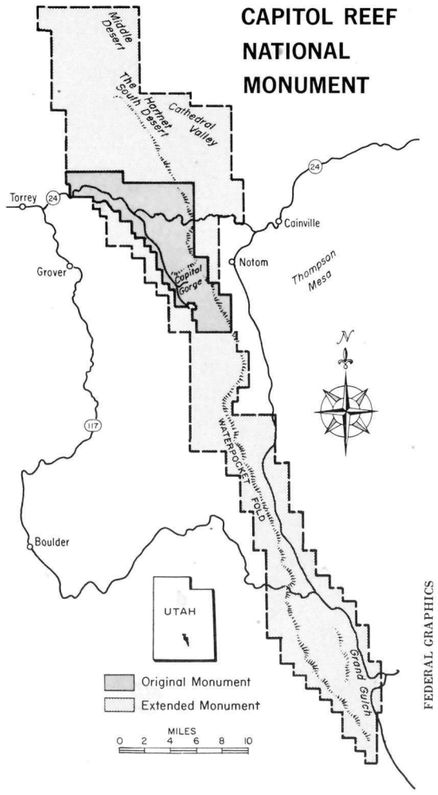
own sense of history. Man and rock had influenced each other to carve the orchard community of Fruita. Mormon settlers best tamed the Fold here, before the world grew smaller. Then the handful moved away. Even today one may have the vague feeling that, in Fruita, time stopped 40 years ago.

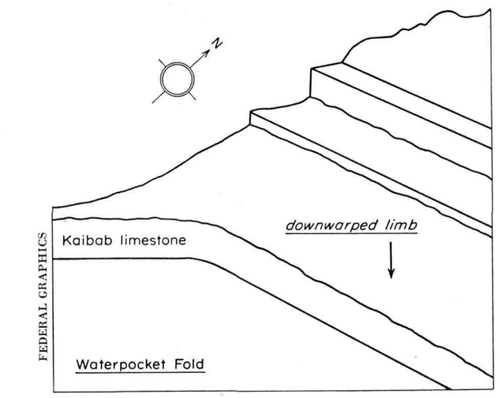
THE MONOCLINE SECTION Thirty miles south of Notom the Waterpocket Fold tightens to a banded ribbon that snakes toward the huge reservoir that has formed behind the Glen Canyon Dam on the Colorado. A dirt road parallels this eastern edge of the Fold all the way to Bullfrog Basin, but it is subject to flash floods and can close rapidly. The steeply dipping beds of the monocline may best be seen as the road winds down valleys and over hogback ridges. Across the way the Henry Mountains loom distantly in their own wilderness, the last mountain range in the United States to be named.

From Big Thompson Mesa one may look straight across into the side of the tilted sandstones. A deep valley—called "The Gulch" by cowboys—separates the mesa from the 1,500-foot-high monocline, which here reminds one of a monstrous breaker dashing in from the sea. Half-moons of sandwiched sandstones roll from the top of the Fold to disappear on the floor of The Gulch several hundred feet below. Arranged in the neat slabs of a Stone Age notebook, the rock units here cross 125 million years of geologic time in brilliant yellow, lavender, maroon, and orange, while each twisted canyon slices a cross section that reveals the inner structure of the Fold.

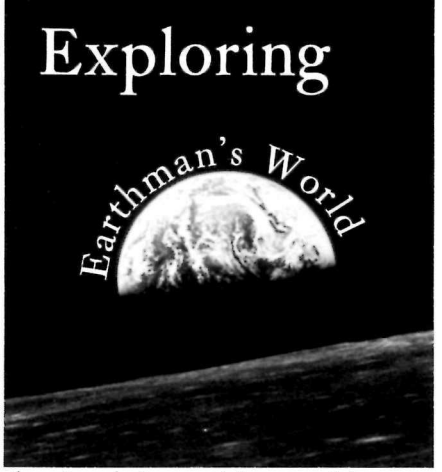
Now as we end our tour, it is almost a hundred years since geologist Dutton first saw the Waterpocket country of southern Utah. To most modern Americans, it is still an unknown land. It has survived men's dreams of uranium, fat Herefords, and fatter oil reserves to keep intact its real treasures, its many earth stories, which are painted in such bold colors "as no pigments can portray." ■







The formation of the Waterpocket Fold can be visualized by imagining a flat sheet of paper lying on a desktop with one end hanging over the edge. Layers of the horizontal limb have since been eroded away, leaving resistant sandstones to form the crest of the Fold. At the foot of this vast monocline a dirt road parallels Hall's Creek snaking through "The Gulch."



A series of short articles examining man's relationship to nature.

THE UN LOOKS AT EARTHMAN'S WORLD

Albert H. Farnsworth

"We must make peace with the natural forces on the surface of the earth if we are to make peace within our own species.

"Socially, a global institution striving to create workable relationships between mankind and the individual; individually, a new attitude inside the horizons opened by fresh knowledge —both of these things appear to be equally essential to man's preservation and development of community in his marginal home between the cosmic realms of death."

These are the closing lines in a little book by Rolf Edberg first published in Sweden three years ago and late last year by the University of Alabama Press in English with the title *On the Shred of a Cloud*. It has had a remarkable influence on the course of human affairs, having inspired the Swedish Ambassador to the United Nations, Sverker Astrom, to put forward his government's proposals for a United Nations Conference on the Human Environment, which will be held in Stockholm in 1972. In a follow-up, sober 66-page report on the Problems of the Human Environment, the Secretary-General outlined with a sense of extreme urgency the things man is doing to his environment. Included in the report is the chilling statement that "if current trends continue, the future of life on earth could be endangered."

Rolf Edberg is now governor of the province of Varmland, Sweden; a former editor, member of Parliament, and representative of his nation in a number of diplomatic posts. In just under 200 pages he explores Earthman's World, reasserts the basic reasons for establishing an international organization, and raises in all its stark reality the great question of our time: Can man survive his own fecundity and folly?

Since its founding 25 years ago the UN has grappled with man's follies—sometimes successfully, often not. Now it is beginning to grapple with man's fecundity. Much of the UN's effort, of course, is centered on the basic issues of war and peace. The nuclear nonproliferation treaty and the test ban treaty, ratified by the members of the UN, have removed some of the dangers of radioactive fallout from atomic explosions.

As technology becomes ever more complicated and destructive in its effects on the environment, the UN comes to closer grips with the impact on the global environment. Just as those issues of war and peace with which the UN grapples know no national boundaries, so, too, the many problems of ecology cross national bounds. These include the rising level of carbon dioxide in the atmosphere, the spread of radioactive isotopes, the destruction of the ozone layer by rockets and high-altitude aircraft which could lead to a "frizzling" effect because the ozone layer screens out the ultraviolet rays; air pollution crossing national boundaries; noise from international aircraft; the use of orbiting laboratories and satellites; destruction of the world's monuments and wilderness areas by mass tourism; the use of pesticides and herbicides whose effects are carried beyond their place of use; overfishing of the oceans by one or more countries; the extraction of minerals from seawater and the side effects of such extraction; the installation of military devices on the seabed; leakage from offshore drilling; the dumping of wastes into the oceans.

Elements of the UN system have been at work on many of these problems. For example, the International Atomic Energy Commission, a UN specialized agency, sets up international standards of safety for atomic energy plants. The Intergovernmental Maritime Consultative Agency (IMCO), another UN agency, has recently made recommendations that, when approved by a majority of governments, will lessen the risks of damage to coastlines and beaches from oil slicks. In 1968, UNESCO, the scientific and cultural arm of the UN, held an intergovernmental conference on the "Scientific Basis for the Rational Use and Conservation of the Resources of the Biosphere." Elsewhere, too, in the UN system, work is going on on many of the problems of how man is ravaging the only home he will ever know.

At the heart of any discussion of the ecological balance of nature or the pollution of the environment by whatever means is the problem of population—more people competing for food and water, for resources, and for finite space. UN projections show a doubling of the world's population—from 3½ billion now to 7 billion by the year 2000—just 30 years away. Until 1965 the UN's activities in population were limited largely to research and demographic and statistical studies largely because of a hands-off pressure from Catholic countries and from the fact that the UN bodies were not equipped to participate in population control problems. In 1967 the Secretary-General decided to create the United Nations Population Trust Fund, which undertakes experimental field projects and plays a role in providing birth control services in developing countries. A level of expenditure of $100 million per year by the year 1972 has been suggested. The United Nations Development Programme now administers the fund, and a senior officer in charge of all population programs of the UN has been appointed.

As Dr. Lars Lund, the senior research chemist at the Norwegian Institute of Air Research, recently stated: "The international question is the difficult one because it requires so many separate political decisions, and it takes so long to get around to doing anything."

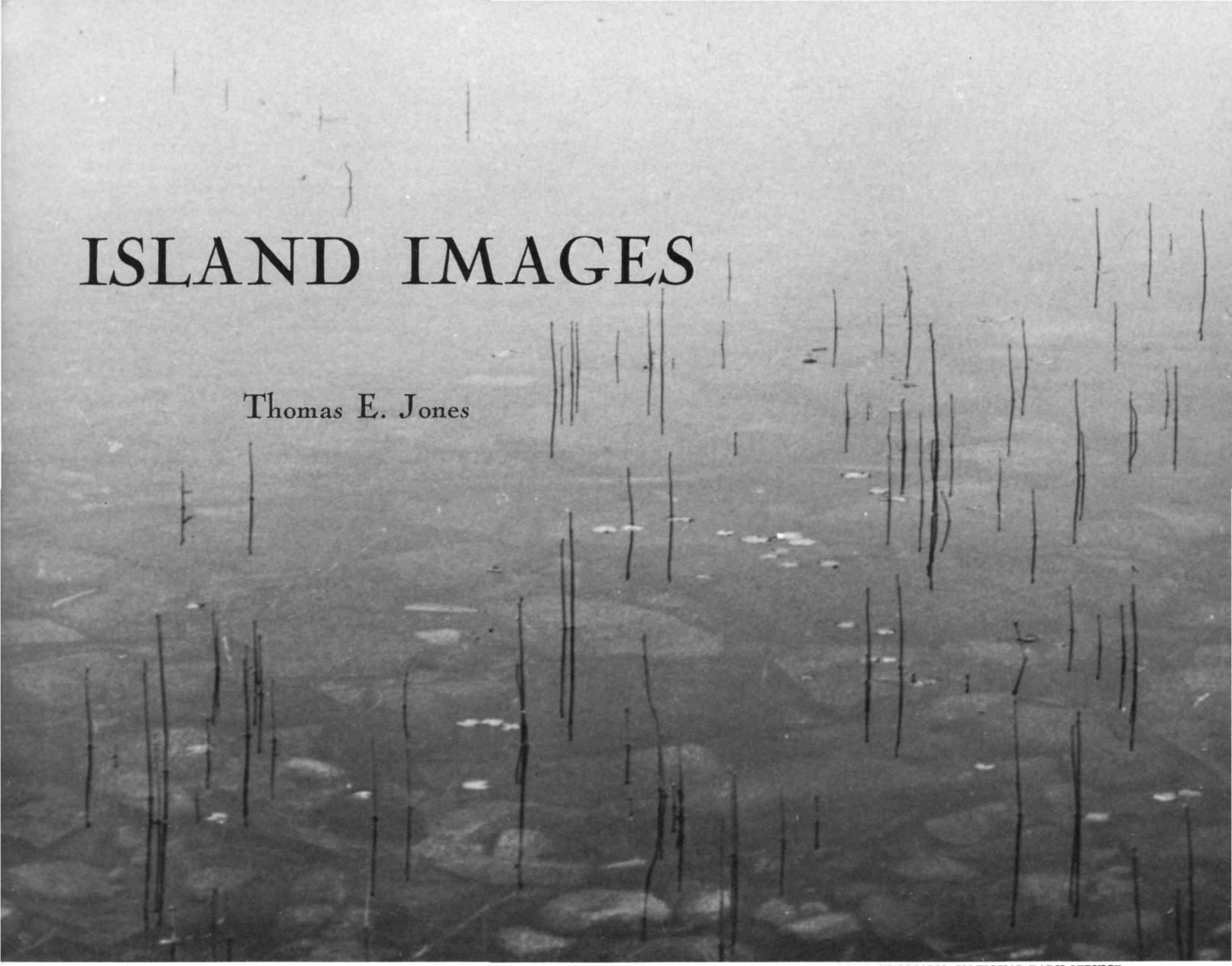
The UN is *moving* and pushing on the problems of Earthman's World. Of course, there is only so much it can do. The organization cannot force anyone to act. However, the UN is a world forum that can focus world opinion on a given issue and frequently mobilize it so that action is taken.

Will we listen and act as the international organization, celebrating its twenty-fifth birthday, moves into new and ever more challenging areas? At stake is survival of homo sapiens.

Mr. Farnsworth is editor of Vista, *a publication of the United Nations Association.*

ISLAND IMAGES

Thomas E. Jones



M. W. WILLIAMS, NATIONAL PARK SERVICE

Last summer I lived in a log cabin on Isle au Haut, off the Maine coast in Acadia National Park. Living at a distance of 6 miles from the mainland and 2½ miles from the island village, I frequently experienced human solitude. At first I found it difficult to live alone; and until the batteries of my transistor radio went dead, I did not have to face the full impact of isolation. Then it overwhelmed me, especially because I had lived the greater part of my life on Long Island, an island congested with automobiles and highways and filled to overflowing with houses and people. But as time passed, I adjusted to my isolation and discovered that my immediate surroundings were far from deserted and lonely, despite the absence of human beings.

Thomas E. Jones is a student at Williams College in Williamstown, Massachusetts.

When I walked along the beach, I began to look for a particular sea gull who, solitary like me, perched every afternoon on the same rock. In the evenings after I extinguished the flame of my kerosene lantern, I began to expect the scurrying noises of the field mice who inhabited the cabin with me. Daily, instead of humdrum human conversation I heard the constant commotion of a waterfall, and instead of the crying of a small child I heard the shriek of a screech owl in the night. Little by little and day by day, I became more aware that I was but a minute part of a great living community. Only when I lived in the presence of no man did I learn to appreciate fully those vital aspects of the world I had long overlooked.

On Isle au Haut, I read extensively about and contemplated man's march toward ecological catastrophe. Realizing that man has lost contact with the reality of the natural world, I thought about new patterns of thinking and feeling that man must develop if he is to survive to appreciate the natural beauty of which he is an integral part.

In geologic time, human existence on the face of the earth has been brief; it has comprised a minute one-twentieth of one percent of the history of life as a whole. In an even smaller fraction of that time, within the 400 years since the Western European movement to the New World, man has flagrantly mistreated the land, air, and water to such a degree that he now is faced with an ecological crisis that threatens his happiness, well-being, and even survival. He has been cradled with the myth that his infinite capacity to build, manipulate, and improvise will extricate him from the morass he has created. Yet the technological panaceas that he so firmly believes in have not been forthcoming—at least, not at a rate corresponding to the pace of his "progress." To use a musical analogy, civilization has been moving to the frantic techno-rhythms of rock'n-roll, while the environment, moving to the less hurried rhythm of evolution, is still singing the "blues."

The current concern for the environment indicates an increasing awareness of the impending crisis and a dramatic turn to the science of ecology for an understanding of it. The domain of the ecologist is the study of living things in relation to one another and their environment. The central theme of ecological research is accordingly crucial for humanity—the understanding of ecosystems and the ways in which man has upset and drastically altered them.

At the root of the ecological crisis is our concept of the man-nature relationship. All disciplines realize that man no longer lives with nature as other creatures do—and as he once did—but that he has become an exploitive power now threatening his own continuance as a species. Man has perverted his once-harmonious relationship with nature, and as a result nature's self-regulating measures for animal communities are becoming unworkable. Although man seldom views himself as a member of any community other than his own community of human beings, he is an integral part of the greater community—the thin blanket of life called the biosphere that surrounds the planet Earth. The biosphere, or the community of life in which all living things possess lifetime membership, is threatened with extinction. The ultimatum for man is either to become aware of his relationship to the total environment and preserve it or to suffer the consequences of his neglect.

Preservation of the environment is one of the most difficult challenges of our time. Inasmuch as man cannot return to a passive, noninterfering relationship with nature, he must learn to conserve the remaining environmental resources and to reexamine the directions and the consequences of his technological progress. He must learn to think and feel differently than he has thought and felt for the last 400 years.

Conservation must become more than a point of view; it must become a way of life. As Aldo Leopold said, conservation is the development of an ecological conscience, a sense of right and wrong about man-nature interactions. An ecological conscience imparts a sense of guilt when man contaminates the environment or, shall we say, sins against his world; its development is indispensable for all men.

Keenly aware of his relationship with the natural world and his dependence on it for survival, the lobsterman of Maine is a practicing conservationist. His occupation demands an intimate knowledge of the sea and of the lobster itself. Realizing that excessive exploitation of the lobster could eliminate the source of his income, the lobsterman abides by a lengthy list of rules and regulations that have been legislated to ensure the lobster's preservation. More, though, than the threat of steep fines and harsh punishments makes lobstermen toss back dozen after dozen of short lobsters; it is an ecological conscience.

By using his unique evolutionary asset, his mind, by means of which evolution gradually has been converted from a spontaneous to a conscious process, man has come to dominate the ecosystems of the world. Regrettably, instead of living with nature as he had in the past, he has been motivated to conquer her. Instead of building empathy with her, he has been motivated to control her for his own purposes. This intellectual fixation purporting mastery over rather than empathy with nature has broken the traditional ties of religion and romanticism that served to hold man close to the natural world.

Besides developing an ecological conscience, man must devote his mental energies to discovering his place in the "web of life." Although he has separated himself from the rest of nature, he is indeed part of it—as Julian Huxley states in *Evolution In Action*, "that part which has become conscious, capable of love and understanding and aspiration." What is desperately needed is the development of these exact capabilities with regard to the natural world.

In the book *The Subversive Science* co-editor Paul Shepard imparts some essential advice as to the direction the application of our mental energies to ecological problems should take. He states:

"If nature is not a prison and earth a shoddy waystation, we must find the face and force to affirm its metabolism as our own—or rather our own as a part of it. To do so means nothing less than a shift in our whole frame of reference and our attitudes toward life itself, a wider perception of the landscape as a creature, an harmonious being where relationships of things are as real as things. Without losing our sense of a great human destiny and without intellectual surrender we must affirm that the world is a being, a part of our body."

Rachel Carson, in her book *The Sea Around Us*, reveals our common heritage with the world around us, linking our metabolism to that of other living things, thus making it easier to view the world as "a being, a part of our own body." She explains that when animal life emerged from the sea, "they carried with them a part of the sea in their bodies, a heritage which they passed on to their children and which even today links each land animal with its origin in the ancient sea." The title of her national award-winning book, *The Sea Around Us*, assumes a new meaning when we realize that "each of us, fish, amphibian, reptile, warm-blooded bird and mammal, carries in our veins a salty stream in which the elements sodium, potassium, and calcium are combined in almost the same proportions as in sea water. This is an inheritance from the day, untold millions of years ago, when a remote ancestor, having progressed from the one-celled to the many-celled stage, first developed a circulatory system in which the fluid was merely the water of the sea."

Another outlet for mental energy in man's attempt to re-establish a sense of proportion and a sense of place in the community of life employs the imaginative faculties of the mind. This creative outlet borrows much of its impetus from the literary genre of poetry.

Poetic imagery entails the seizure and the subsequent exploration of hidden likenesses, and it attempts to give meaning to experience by creating unity from unlike elements. By holding together two parts of a comparison that give depth to one another, two moments of vision are produced. The first is the moment of appreciation; the second is the moment of creation. During the latter moment the two dissimilar parts fuse to provide a greater unity than had previously been realized.

Ecological imagery, then, is the fusion of two dissimilar aspects of nature, a process limited only by the imagination. Using the devices of metaphor, simile, analogy, and comparison, mental images may be formed that provide the individual with new insights into his relationship with the natural world. These new insights provide a growing awareness and sensitivity to nature's intricate balances.

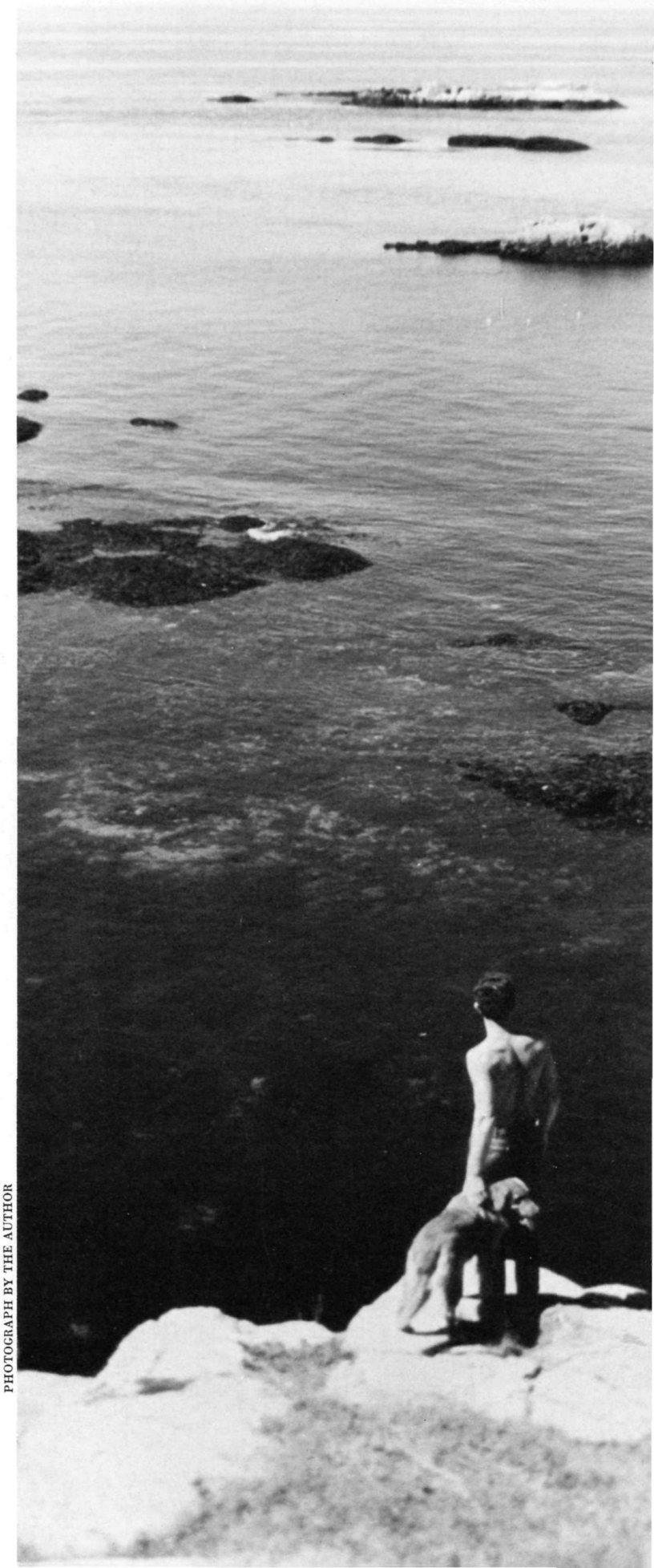
Islands evoke a wide assortment of ecological images. As a distinct ecological unit, an island parallels the process of human development, exemplifying the unique product that process creates. Insulated by the sea, a solitary island is similar to the human embryo enveloped in a miniature sea within the mother's womb. Not unlike the human embryo, the island inherits traits from its parent, the coastline. Despite its resemblances to the parent coast, however, an island, like a human individual, has its own individuality.

The uniqueness of each island is consonant with the human aspiration for individuality. It is not surprising, therefore, that islands frequently are treated in literature as places of refuge from a crass world or places where romantic individualism is best pursued. Delimited by an ocean barrier, an island represents a world in miniature, a replacement for another, more dominating world that is left behind.

Migrating north when the necessary climatic conditions prevail, a summer visitor, like the common eider duck, may seek a secluded island's harbor for his summer refuge. There he, too, may become at one with the island and hopefully a part of the living island itself.

The vast dimensions of sea and sky may be contemplated by anyone standing on the shore gazing into an open ocean. Many writers equate this experience to standing at the brink of consciousness, at the point where the pervading realities of sea and sky become unfathomable and consequently summon into their places thoughts, feelings, and impulses theretofore excluded from consciousness. Perhaps this is where man can best sense the arcane and primitive rhythms that move him despite his unending attempt to sever himself from wilderness to become urbane and sophisticated.

In this age of exploration in outer space, it is due time for man to voyage to inner space—to confront his conscience, to respond to the ancient rhythms of nature latent in him, and to regain and practice reverence for her. Just as Samuel Champlain named Isle au Haut off the coast of Maine to aid future ocean navigators, so man now must chart landmarks of thinking and feeling—wisdom and conscience—to guide himself and those who follow him through the future. ■



PHOTOGRAPH BY THE AUTHOR

All on a Summer's Day

DOROTHY TREBILCOCK

In sun and sand
little-boy dreams
and grown-up realities
merge . . .

fresh as sun-spliced blue
fragile as the instant before
the wave breaks white.
"What makes those waves?"—
query old as . . .

CECIL STOUCHTON, NATIONAL PARK SERVICE

stumps of time
waiting in sands of antiquity
for an answer.

dorothy trebilcock

National Park Service Educational Programs

The National Park Service has developed two environmental education programs designed to help elementary and high school students understand the relationship of man and his environment and to lead them to adopt an environmental ethic. These programs, called the National Environmental Education Development (NEED) program, and the National Environmental Study Area (NESA) program, have been tested nationwide for approximately 2 years.

Under the NESA program the Park Service now has 64 locations throughout the Park System that are used on a day-use basis by local school systems as environmental study areas (ESA's). After establishing an ESA in a national park, the Park Service holds a workshop to introduce teachers to the philosophy of the program and to the physical layout of the area, to discuss how the area can be used within the existing curriculum, and to provide hints on how to manage children outdoors. Park Service personnel assist teachers in developing school curricula in various disciplines—math and history as well as biology and geology—by discussing how the ESA can be used to help children observe concrete examples of patterns of structure or behavior, similarities and differences, interaction and interdependence, change and continuity, and adaptation and evolution. Once the program is set up, classes visit the various ESA's as frequently as the curriculum and budget allow. The classes go to the ESA's by school bus and spend the school day there, taking their lunches with them. Teachers assume full responsibility for teaching the class and for relating the experience to the curriculum by presite and postsite discussion with the students.

The NEED program, funded by the National Park Foundation, is developing teaching materials and a program of studies and experiences in three phases for kindergarten through high school to help enrich already-existing curricula with environmental concepts. Also an interdisciplinary program, the NEED materials guide teachers in how to teach about the environment in every subject area. These materials are lively, modern, in considerable detail, and well illustrated. In phase 1—what could be called the "awareness phase"—during grades kindergarten through 6 the focus is on understanding and appreciating the natural and cultural environment. In the second, or "technical phase," seventh and eighth graders study man's use and abuse of air, water, land, and other resources. Finally the "ethical phase" stresses for high school students the need for environmental management and planning—the development of an environmental ethic.

Throughout the NEED program students may go on local field trips to supplement their classroom studies, and sometime during the fifth or sixth grade the children spend 5 days with their teachers in some natural area. Some NEED sites are in national parks, but not all are. Eating and lodging accommodations for teachers and children are necessary at all NEED sites. Originally the intention was to get the children who needed this experience most—inner-city children—out into a natural study area for an entire school week.

In both the NEED and NESA programs the emphasis is not on identifying or labeling, but on discovering patterns of structure or behavior. For example, by recognizing similarities and differences, a child will discover the various patterns these characteristics make. Hopefully, this discovery will lead him to see basic interactions and interdependencies that are operative in his own environment and may lead him ultimately to help the community effect constructive changes toward a balance of the natural and man-made worlds.

Both the NESA and NEED programs emphasize man's relationship to his environment—and specifically the child's relationship to *his* environment. A week or even a day in a pristine natural area may arouse in an inner-city child resentment because he cannot *live* in such an environment. However, these programs aim to help that child learn from his outdoor experience how the ecosystem he observed works, draw parallels to see how he fits in his ecosystem (whether rural or urban), and realize that the same laws govern all ecosystems.

For each child these programs are designed to answer the question, "What does this matter to *me*?"

Pilot testing of third-fourth and seventh-eighth grade materials was conducted with 1,200 children at 12 different sites. Fifth-sixth grade NEED materials were tested at 25 locations across the nation involving approximately 20,000 children of widely ranging economic, social, and cultural backgrounds. In 1969 National Park Service personnel were involved in 169 ESA workshops attended by 3,340 teachers, and over 27,600 students used the various ESA sites. The Park Service and the schools jointly have produced resource guidebooks for 33 ESA's. A general guidebook to help schools establish and operate ESA programs was published recently and is available from National Education Association, 1201 16th Street NW, Washington, D.C. 20036.

NESA began as a network of National Park Service study areas. Now the concept is taking on new dimensions. Study sites are being established on other federal, state, and private lands. It looks like the National Park Service has stimulated some profoundly significant programs in interdisciplinary environmental education. If they catch on, our children just might grow up *not* asking "What does this matter to me?" They'll know. ■

For more information contact Office of Environmental Education, National Park Service, U.S. Department of the Interior, Washington, D.C. 20240.

RALPH ANDERSON, NATIONAL PARK SERVICE

PHOTOGRAPHS BY THE AUTHOR

earth's words in the national parks

darwin lambert

WITH MUFFLED GIGGLES the class double-filed from the school bus into the national park visitor center. The teacher joined two others conferring with park naturalists, and the children came across the lobby and stood near me with two other classes just inside the large window-wall looking into an active cloud. Drizzly fog lifted and allowed a visual sweep of Big Meadows before closing again. Breathing quickened around me with varying engagement of voice as when fireworks explode on the Fourth of July.

Despite the weather the children acted eager to go out, so I guessed I would, after all, see the recently designated Environmental Study Area (ESA) at Big Meadows in Shenandoah National Park in use. I had prepared. The guiding thoughts of Director George B. Hartzog were in my mind: "Recognizing the need of the National Park Service to relate its programs to the urgent needs of society, we have looked with a new concern to the national parklands which are superlative examples of the nation's natural, historic and cultural resources. . . . How best can we use these living standards of excellence in the national search for an environmental ethic?" I had traced environmental awareness through the year's regular campfire programs and nature walks, and I believed what awaited me now would demonstrate even more clearly a momentum-gathering, lastingly significant change, not merely in the parks' long-established educational-interpretive program but in man's understanding of his basic situation.

Textbooks, notebooks, and pencils were lacking, but during the brief introduction that preceded the exodus the children admitted they had brought something to help them learn—eyes, ears, noses, skin, hands, tastebuds. Having put on coats and boots, we braved the drizzle and the cloud-lid hovering in our hair. The fourth-graders I was accompanying moved tentatively in groups toward the misty unknown.

Perhaps my preparation—research for a man-and-earth book centering on Shenandoah National Park—had been too intensive. As my feet sank into softness and my face felt the droplets caress, phrases from Whitman marched inside me: "Were you thinking those were the words, those upright lines? those curves, angles, dots? / No, those are not the words, the substantial words are in the ground and sea, / They are in the air, they are in you. . . . Air, soil, water, fire—those are words, / I myself am a word with them—my qualities interpenetrate with theirs."

The thirty of us lined up along the shoulder of Skyline Drive. When the teacher signaled, we crossed—adults walking, children running, continuing to run down a long slope. The teacher grinned and let them go, even waved on the hesitant few. They ran and leaped. One boy tripped and rolled—and showed surprise that the vegetation held water as does a sponge. A girl found a brown seed-head and waited to ask us what it was. A group far ahead bounced on swamp sod, sometimes splashing.

"Human bodies are words, myriads of words," chanted Whitman. "Every part able, active, receptive, without shame or the need of shame. . . . I swear I begin to see little or nothing in audible words, / All merges toward the presentation of the unspoken meanings of the earth, / Toward him who sings the songs of the body and of the truths of the earth."

Children gathered near a boulder where one had seen something move. Soon a boy had a wiggly creature and was teasing the girls. The teacher called his name, and he put the salamander into the naturalist's outstretched hand. (Naturalists accompany classes during introductory phases of the ESA program.) The whole class came to see. "The salamander is tender and defenseless out of its home," the teacher said while the naturalist interposed alternate hands as it kept trying to crawl off and drop. "It's adapted to a wetter house than we are, using the ground as floor and the rock as roof to protect itself from drying wind and sun."

We explored, finding resemblances and differences, interrelationships. As fog engulfed us once, the teacher asked who had been inside a cloud before. Several students believed they had. "We're 3,500 feet above sea level here," she said. "This mountain is often in clouds. Since it is always covered with vegetation, it serves as a watershed—which means it gathers rain and snow and keeps streams flowing when otherwise they might go dry. Does anyone know where the clouds come from?"

One boy said, "West"; another, "South." But a girl had an answer that led into the ocean-wind-cloud-rain-river-ocean cycle and introduced water pollution. "Streams up here in the park are clear and clean," the naturalist explained, "but when they go through farmlands and cities and past factories, they get contaminated nowadays by sewage and chemicals."

The cloud lifted, higher this time, getting brighter. My mind turned inward again, reviewing. National park interpretation had grown a lot since beginning as "nature guide service" at Yosemite half a century before. The seed, so to speak, had been gathered in Europe by C. M. Goethe and planted, with encouragement from the first Park Service Director, Stephen T. Mather, by Goethe, and by Harold C. Bryant (both of whom I had been privileged to know in person, though too briefly). The idea was to help "nature lovers" read park trailsides and scenes "like a book." Yellowstone had the first official park naturalist. Other parks launched programs—and some, museums—with help from universities. In 1923 a chief park naturalist, Ansel F. Hall, was named for the entire system, but funds were lacking.

"Nature lovers" were special people and too few. An early notion was to "popularize natural science," and for decades the identification of living species or of kinds of rock was a major concern (too major?). Another lasting purpose was to interpret scenic magnificence in such a way as to increase "pride of country and, as a result, patriotism." A few early leaders wanted to see "thousands of public school children and college students camping out in the national parks every summer in charge of persons capable of

explaining to them the meaning of scenery and the workings of nature." Students did come, yet the difference from today's man-in-the-web-of-life concept remained fundamental. Scenery and nature were other than man, their power and grandeur perhaps "sublime," their beauty "charming," their relationship to man largely "romantic," their effect "soothing" or "inspiring" or, if educational, still only useful at the "cultural" fringes.

Headlines in October 1925 proclaimed Interior Secretary Hubert Work's epochal denial of control to recreation, his plan to perfect the park system as a national education institution, giving our "first temples" their proper place "in the higher education of our people in the 'finer things.'" At that time Bryant established the Yosemite Field School of Natural History for intensive instruction of budding interpreters. The deeply grounded concern of John C. Merriam, president of Carnegie Institution, began to show itself—through National Parks Association and later through the Secretary's national park educational committee. By 1930 a branch of research and education, headed by Bryant, was spreading interpretation systemwide.

In 1943 Merriam published a book called *The Garment of God* dealing specifically with the "influence of nature on human experience," but few fully grasped his hopes for a caliber of education in the parks that could change the course of human living and feeling. Much Merriam thinking had been published earlier in *National Parks Magazine*. (Forgive me if, while writing, I use notes for exact quotations; the thoughts really were with me at Big Meadows as the sun peeked through that indecisive cloud.) "Protection and interpretation of nature . . . gives an opportunity comparable to development of a great art like literature or painting. . . . We need today an integration that involves science, the arts, and human interest in order to give clear expression to what is most significant in our relation to nature. . . . This relationship may express itself through the gamut of human interests and reactions, ranging from what seem purely physical activities on through the aesthetic, intellectual, scientific, philosophic and religious. . . . The great cultural and spiritual value of outstanding phenomena in nature . . . may concern things of the day alone, but it relates also to what might be called permanent reorganization of the mind in such manner as to give new views of the universe and of our place in it. . . .

"When one looks upon nature, and recognizes its values, there arises inevitably the inquiry: 'What does this mean to me? What is man's place in the world of nature?' Without insisting upon details in the story of human origin and evolution, the scientist finds it difficult, if not impossible, to avoid thinking of man as embedded in nature and dependent upon it."

Others also were expressing through the Magazine thoroughgoing concepts of man-earth unity that only now are reaching general understanding—Vernon Kellog, for example, in 1930: "As science and art and religion more and more converge to form a single comprehensive world philosophy, the mission of the parks assumes an evergrowing importance. The grandeur of nature reveals the grandeur of creation. The astronomers find this creative grandeur in the suns and planets of the heavens. But we may readily find it here on earth. It is breathtakingly revealed in our national parks."

At this point the teacher interrupted my musings with the request that her students lie down on the site of the old home now thick with the thorny locust of a returning forest, close their eyes, and imagine the life of Blue Ridge pioneers. A girl protested that the ground wasn't dry yet, but another silenced her: "Sissy! Those pioneers would've been out in real hard rain before they got their cabin built." All complied then and stayed silent for several seconds, during which I reflected that Shenandoah was even better suited than most national parks for environmental education because of the varied exploitation it had been through before being allowed to go wild again.

"They'd be chopping logs for their cabin," one voice said.

"No—first they'd've found a spring for water supply, or maybe killed a deer to roast on a campfire."

"Good, good. They knew they lived on and in nature. Do we?"

"I think they'd cut all the logs out of one place and make a garden."

"Yes—perhaps they would. But don't you think when they plowed so steep a slope, the soil might wash away?"

My mind shifted to a book by Hans Huth, *Nature and the American: Three Centuries of Changing Attitudes* (1957) —pioneers using ax and gun and crosscut saw to conquer nature, then literature and art encouraging a sense of natural beauty that sparked the park-preservation movement, that beauty-sense maturing into love of wilderness and ability to draw inspiration from the natural scene.

But hadn't the attitude been changing even since Huth wrote, altering park-inspiration to include less of the romantic and more of the real and relevant? Could we be working consciously at last toward what Sigmund Freud recommended, though it might take several generations—harmonizing our inner psychic world with the scientifically demonstrated realities? Were we using at last the compass that only a few had previously glimpsed—and beginning to blend man's soul with nature, man's feelings with life's necessities, and finding in surprise that the combination was not absurd or degrading but vitalizing, even glorifying?

National Parks Magazine published in 1960 an article by Joseph J. Shomon that spoke of America's high "standard of living," then asked, "How well have we . . . adjusted our way of life to the land upon which we live and to the living things of the earth that feed and clothe us? . . . There is a distinct need for the emergence of a strong ecological conscience among men, a sensitivity and a sentimentality toward the Good Earth that sustains us." Aldo Leopold, of course, had already discussed ecological conscience and a land ethic, but we had resisted mixing action with sentiment. Ecology was fine, we said in effect for many years, but it did not involve man. We persisted in seeing earth husbandry and earth feeling as separate, instead of as two facets of the same unity.

Then came, we might say, the revolution. Stewart L. Udall discussed *The Quiet Crisis* and, partly because of that book, the crisis ceased to be quiet. Under Udall the Interior Department focused such patterns as the "Quest for Quality," the "Population Challenge," the "New Conservation,"

"Man, an Endangered Species?" and "It's YOUR World." Suspicion grew to certainty that something had gone wrong between man and "nature." Outdoor interpretation spread among governmental agencies. Pollution and the threatened environment began appearing in headlines and booming out on the airwaves. The conservation movement burgeoned. Congressional committees reported what no such groups had ever reported before: "If it is ethical for man to value his chances for survival, to hope for a decent life for his descendants, to respect the value that other men place upon their lives, and to want to obtain the best that life has to offer without prejudicing equal opportunities for others, then the cornerstone of environmental policy is ethical. . . . A comprehensive policy toward the environment cannot help but be philosophical rather than specific."

Hartzog began committing the National Park Service's educational resources. "It seems clear," he said, "that we must meet at least two minimal needs—the need for environmental education of a scope never before undertaken, and the need for a man-centered environmental ethic. . . . Our national parks are comparable to the canary in the miner's cap, a stilled voice signaling the presence of death in the mineshaft air. Parks are our early warning system. . . . Our interpretive programs have attempted to communicate to every visitor the excellence each park area embodies. . . . If we have failed, we decided, it was in not bringing the visitor into the center of his park experience. The parks, like life, are meant to be lived. The answer, we believe, is man himself. . . .

" 'Know thyself' was the advice of the gods as written in the temple at Delphi. It is in answer to this need to know oneself that the National Park Service environmental education materials are designed." He offered partnership plans to the schools and directed that regular interpretive programs, too, should reveal "the interrelationships between man and his environment."

At Big Meadows sunshine had definitely won over drizzle, and three ESA classes gathered together for lunch on the warm side of the visitor center, all sitting on clean gravel. Several deer came into sight. Near a clump of bushes they paused and looked at us. Children, looking back, stopped chewing. The deer entered the clump, browsing, moving on a few steps, browsing again. They were "words of the earth" along with the grass, the bushes, the far forest, the sun-sparkling moisture, the softly pushing breeze.

"I swear there is no greatness or power that does not emulate those of the earth," chanted Whitman. "There can be no theory of any account unless it corroborate the theory of earth, / No politics, song, religion, behavior, or what not, is of account, unless it compares with the amplitude of earth, / Unless it face the exactness, vitality, impartiality, rectitude of the earth. . . ." Children started chewing again while watching the deer browsing, and I felt surrounded by fateful meaning. "The workmanship of souls is by those inaudible words of the earth, / The masters know the earth's words and use them more than audible words."

My scattered thoughts somehow coalesced, and I saw the word *ethic* as falling short of expressing modern man's basic need. An ethic is a code of conduct. Be it ever so reasonable, even demonstrably essential, it still might remain ineffective because motivation for adherence fails to

match the strength of competing drives. Working out the ethic, even securing mental agreement, is hardly more than a beginning. The larger need, as it came clear to me while watching the children and the deer, is the generation of enough man-earth feeling to put earth care ahead of wealth accumulation in the scale of values, ahead of our rate of consumption (or "standard of living"). We, the people, as repeatedly demonstrated in experience, are not likely to be media-frightened or orally persuaded or legally coerced into genuinely ethical behavior. The motivation had to mobilize itself within us; and if it were to do so, we had to receive earth's messages in our viscera as well as in our brain.

The National Park Service was filling part of the need, but was the process well enough understood to be maximized and repeated at will? I saw interpretation beginning as a synonym for translation, fostering again the earth-literacy that had too generally dwindled as language-literacy increased. Yet translation of earth's words could be only fractional, as of the visible part of an iceberg. Did the interpretation facilitate reception of earth's messages at the largely unconscious level from which lastingly effective human power springs (and as it flows, produces life's greatest satisfactions and fulfillment)? Or did the interpretation merely help bring the superficial fraction to the brain, where, at best, the right tools for utilization of basic power, should it perchance rise, might be designed? Perhaps the truly significant accomplishment was the simple one of bringing children into situations where their receptors, as yet not heavily clouded by civilization's distortions, could garner the unadulterated "words of the earth."

Looking around me, I felt that the children were receiving unspoken messages—which might contribute, as Merriam had suggested, to a "permanent reorganization of the mind in such manner as to give new views of the universe and of our place in it"—and were also undergoing Whitman's "workmanship of souls." The process is certainly more difficult for most of today's adults; but at that time and place anyway I believed that we all, urban in origin as well as rural, still received, though plagued by a bit more static.

What came through my own static seemed enough, however, to confirm the essential truth that the way to harmonize with earth, to save our planet from degradation, lay through *feeling* (not merely rationalizing) our oneness with natural reality. Only when large numbers of us were so feeling, would we have the persevering power to overcome obstacles built during the nature-conquest stage of our civilization.

The national parks seemed to have promoted themselves

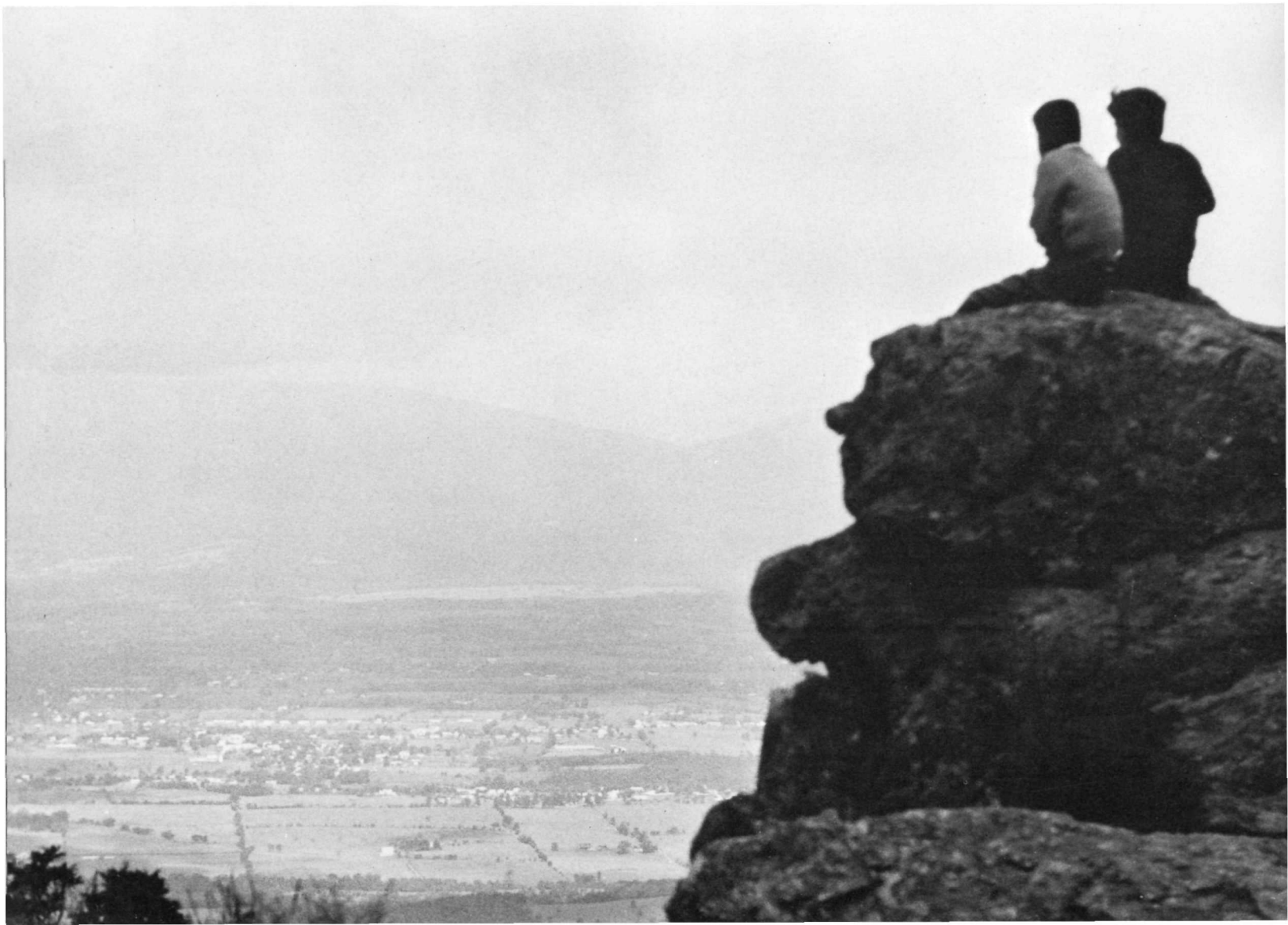
into a key sector of the fight for the future of man. I felt that only one more stretch-step was needed. Director Hartzog may have considered himself extravagantly ambitious when, in the frame of scenic magnificence as representing our national heritage, he aimed for "a truly national ethic." Even that would be difficult to achieve—but would it be enough? We could well be proud as a nation (such pride surged in me at Big Meadows) of having set aside and protected our national parks. Yet what the nature-parks really show is not the glory of a nation but the glory of our planet. They speak not in national words, not even in man-words, but convey their potent meanings in earth words—which, equally with environmental pollution and resource depletion, ignore national boundaries. As Dr. Michel J. Batisse of Paris said in San Francisco during a 1969 UNESCO conference, solution of the environmental problem "requires a will, a collective will of all nations. It requires a new philosophy of the relationship of man with nature, accepted by all. . . . It requires a complete reassessment of many values which will affect economic theory, social structure, political institutions."

The class and I climbed Black Rock after lunch and sat on the high cliff. The wind was in the children's faces and mine, blowing hair not protected by hats or parka hoods. The valley floor was miles distant, more than half a mile lower in elevation, hazy and indefinite like the surface of an unknown planet. Smoke rose here and there to the level of the rim opposite us, a lower mountain, and swept toward us as a gray layer in the atmosphere. "That land down there is best for farms and factories," the teacher said, "and for homes, highways, and cities. See them—just barely? That soil doesn't erode as easily as the steeper land up here, which is best for forest and watershed and outdoor enjoyment."

"I saw soil in the river once—after a thunderstorm," a boy said, perhaps too loud. "It looked like gravy."

After that we stayed quiet on the high rock, looking down, looking far toward the west into the wind. ■

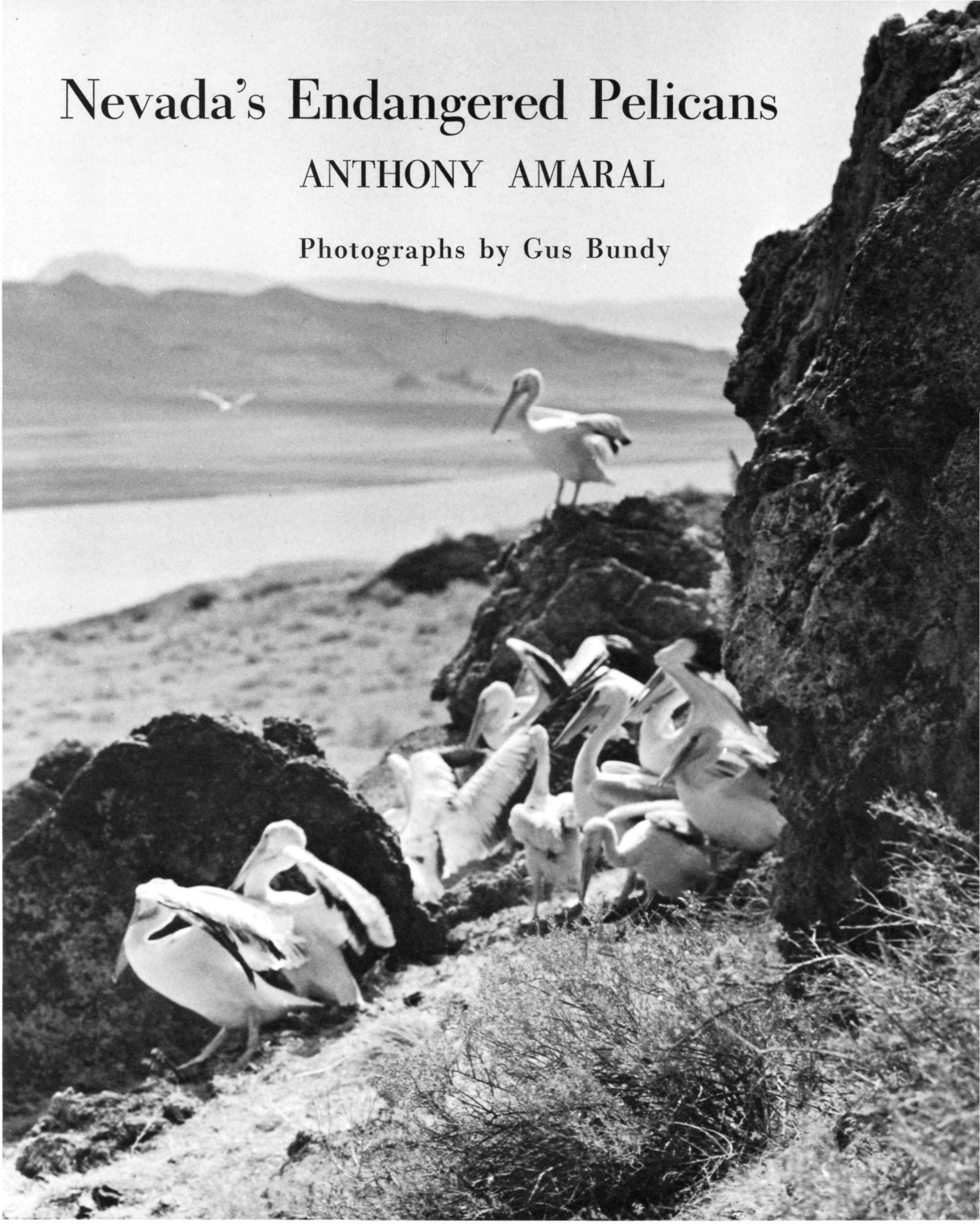
Darwin Lambert, formerly a newspaper editor, is now a freelance writer with several books and many magazine articles to his credit, and a Trustee of the National Parks & Conservation Association. Mr. Lambert practices what he preaches at his home on the western slope of Virginia's Blue Ridge range not far from Luray, where he is currently working on a new book about Shenandoah National Park.



Nevada's Endangered Pelicans

ANTHONY AMARAL

Photographs by Gus Bundy



WHITE PELICANS have come to Anahoe Island on Nevada's 10,000-year-old Pyramid Lake possibly centuries before ancient man lived on its shores. Now their population at the lake is declining as they are threatened by modern man's innovations.

Pelicans belong to Pyramid Lake as much as they do the ancient biblical lands near the Dead Sea, where a psalmist wrote of them as a symbol of wilderness and desolation. At the moment Pyramid Lake reflects this condition. Only 30 miles north of Reno, the refreshingly clear lake sits unbelievably in arid, quiet desert surroundings—a part of the Paiute Indian Reservation.

Anahoe Island, on the southern end of the lake, was made a national refuge in 1913. It is now the largest pelican rookery in the United States. About 3,000 young were hatched on Anahoe in 1968. The 1969 census of pelicans on Anahoe showed an increase of 400 nest sites and about 500 more pelicans. However, these figures are misleading because pelicans did not nest at Bear Lake on the Idaho–Utah border. The water level was too high, causing adult pelicans to abandon Bear Lake. It is believed that some arrived at Anahoe.

Anahoe looms out of the water like a description of Jules Verne's Mysterious Island, an irregular-shaped mass of purplish-brown rock. There is no shade. Only scrub brush grows defiantly from the gravelly soil. Close by, a pyramid-shaped rock juts up 600 feet from the lake, a massive edifice that reminded John Frémont of the Pyramid of Cheops and inspired him to name the lake during his explorations in 1844. But Frémont did not see the pelicans during his winter passage through western Nevada. They were at their winter haunts in southern California and western Mexico.

Pelicans start arriving at Anahoe in mid-March, and the migration of birds lasts until April. The adults pair off and begin making a flimsy nest with grass and sticks. Usually two chalky white eggs are laid, and incubation lasts for about 30 days. One adult almost always is in attendance to protect the eggs from the hot summer sun and the mischievous gulls. Even after hatching, the young require the shade of a parent, or overexposure will be fatal.

During the early summer months all stages of pelican growth are evident. Some are naked pink, others homely little balls of down, and some are already showing their pinfeathers.

The young pelicans mature rapidly and reach flight growth in about 2 months. At that stage they weigh almost as much as mature pelicans—15 to 20 pounds. By the time migration flights begin in September, they are strong, full-grown adults.

Pelicans are shy, wary birds. The moment man appears in proximity, adults will abandon their eggs or chicks and wobble along and snap their wings with a flutter of excite-

ment. Clumsy as they appear on land, once they are airborne they are in their element.

High above, they form vast formations and circle overhead with ballet precision—tilting and gliding, banking and coasting with an ease that makes them one of the most attractive birds to watch. Pelicans enjoy flying at great heights. Even at 300 feet above they are easily visible, for they are large birds with their black-bordered wings stretched 4 to 5 feet from their bodies as they soar on summer thermals.

On Anahoe Island hundreds of nests constitute a colony. It seems impossible that in the close huddle of nests the aimlessly wandering young ever could be identified by the parent birds. Of course, they are, when the parents return from feeding at the Truckee River Delta.

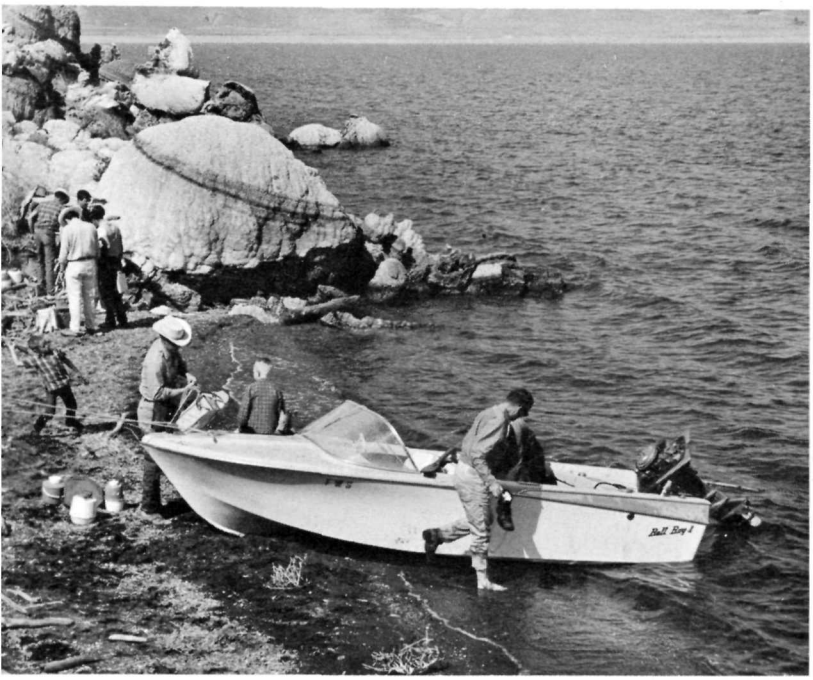
At one time, sportsmen accused pelicans of feeding on the diminishing lake trout. Many birds were shot and eggs destroyed before intensive tests proved that Anahoe pelicans subsist on chubs, suckers, and other trash fish that are easier to catch and are abundant in the lake.

"But now," says Larry Worden, manager of the Stillwater Management Area of which Anahoe Island is a part, "increased recreational use of the lake, boating especially, is causing problems the birds may not be able to cope with. Pelicans loafing on the shore are harassed by boaters who circle the island for an inquisitive look at the birds. Some boaters even land to observe more closely. Consequently, adult pelicans abandon their nests of young in a frightened scurry that frequently causes them to break eggs with their feet or wings. Hatchlings are left exposed to the hot sun while the intruders scout the island. If the exposure does not kill the chicks, California gulls have the opportunity to take devastating tolls on eggs and peck to death the young chicks."

Hunters are also taking a toll. The pelican is not protected by the Migratory Bird Treaty, and many leg bands returned to wildlife officials are from birds that have been shot. The hunting pressure is particularly heavy in Mexico, the winter haunt of many pelicans.

Other factors, too, are contributing to the decline in pelican numbers. Jim Keith, a U.S. Fish and Wildlife Service biologist at Davis, California, is convinced that pesticides are harming the bird population. For 8 years he has conducted a study on the mortality, lifespan, and reproductive ability of the pelican with emphasis on pesticide influences. Keith is concentrating his program with the pelicans because they are easier to sample and collect, but his studies will be applicable to other water birds that also are suffering a population decline.

"We are fairly certain," he told me, "that the population turnover of the pelican is faster now than before 1945. That was the year increased use of pesticides began." At that



Anahoe Island is rimmed with unusual tufa formations. Above, federal and Nevada state wildlife biologists use the narrow beach on the north side of the island to begin their trip to the pelican nesting sites. Banding and wing marking help biologists determine migratory habits of the birds.

time, about 10,000 pelicans came to Anahoe. Today, less than half that number arrive on the island.

Keith has learned that grains treated with pesticides are washed into drainage ditches and ultimately into the marshes, where they are eaten by the fish, which later are eaten by the pelicans. This chain has been the particular cause of large numbers of pelican deaths in the Klamath Refuge and the Clear Lake National Refuge, both in California. The birds may not be able to survive long enough to develop a resistant population. California pelicans are now considered a threatened species.

Certain pesticides accumulate in the fatty tissues of the pelicans on a cumulative basis. When the birds are under stress, as during migration when they rely on their fat storage for energy, the accumulated pesticides are too toxic for the birds to survive such a dosage.

The University of Wisconsin recently concluded a series of tests that have proven that shell thickness of predaceous birds correlates precisely to the concentration within the eggs of DDE, the breakdown product of DDT. According to wildlife scientists at the university, DDT or DDE stimulates the liver to produce enzymes that break down sex hormones in the blood. Lowered levels of the hormones keep birds from mobilizing calcium needed to develop normal eggshells. Thus thin-shelled eggs correspond with a sharp change in shell thickness beginning in 1947, just after DDT was used generally. The scientists credit the sharp decline of bird populations to a reproductive failure in which adult birds accidentally break their thin-shelled eggs.

Intensity of pesticide impact may be less on the Pyramid Lake pelicans, however, than on the California pelicans because there is less agriculture in Nevada than in California. But other ominous problems threaten the pelicans—and for that matter, all of Pyramid Lake.

The lake is shrinking. Since the construction of Derby Dam in 1905, which diverted water from the Truckee River, Pyramid Lake's only inflow, the lake level has dropped about 100 feet. When Anahoe Island was made a refuge in 1913, it measured 228 acres; now it has 750 acres—the added area exposed by the lowered water level.

The waters of Lake Tahoe, which feed the Truckee and other mountain streams, have been under usage study for many years by California and Nevada. A compact has been drawn, but no agreement as to water usage has been satisfactory to both states. Pyramid Lake, it seems, has been left out of significant consideration, and it is preposterous to assume that attempts ever will be made to raise the level of the lake. Increasing upstream use and projected population and sewage requirements in California and northern Nevada preclude this possibility.

"Unless there is a climatic change," Larry Worden told me, "the lake will continue to lower. Recently enacted Interior Department rules regulating diversions from the Truckee will slow the decline."

The effects of this dropping water level were predicted in 1908 by W. H. Chapman, an ornithologist. He said that the continued lowering of the lake would form a land bridge from the eastern shore to Anahoe Island. "While these

effects do not appear imminent," he concluded, "[they are] inevitable with the lowering of the lake."

Now, 62 years later, the threat is imminent. Only 300 feet separate the desert from the island, and the water depth is about 20 feet. The next decade seems certain to expose a connecting land link from the desert. Predators would quickly doom the pelican colonies—and the double-crested cormorants, Caspian terns, great blue herons, and the gulls.

Plans are being studied by biologists concerned with Anahoe Island to possibly dredge any land bridge connections and somehow build drift fences that would force predators from the island. Other ideas are being considered. But until conditions become more explicit, no one is certain what will effectively protect the island and its bird life. It is even conceivable that further concern might be fruitless if Pyramid Lake is developed recreationally as now seems certain. Then the pelicans may disappear from their age-old incubator, for the pelican seems adamant in its demand for seclusion. If disturbances are not kept to a minimum, then the entire colony may not raise enough young to offset reductions in population. This aspect of the pelican's nature caused one authority to say that he is concerned about the pelican as a threatened species, even more so than their numbers would indicate.

Overall pelican numbers have decreased. Formerly, pelicans nested on at least 10 areas in California; today there are only two. Thus the Anahoe Island Refuge has become an even more critical area, because it still supports fish in the lake and so far offers the birds some solitude from man's water activities.

Larry Worden, Jim Keith, and others are facing the magnitude of the problem of pelican survival at Anahoe Island with energetic thinking and determination. Still, one cannot help wondering at the odds, especially when considering ornithologist W. L. Dawson's succinct appraisal of the pelican's plight:

"The pelican and the wilderness stand together in their mute appeal. When one is reclaimed, the other must perish." ■

Anthony Amaral, a free-lance writer on western Americana and natural history, has three books to his credit. Currently he is working on a book about Nevada's wild horses.

news & commentary

FDE FIGHTS FLORIDA BARGE CANAL

Further appropriations for the Cross Florida Barge Canal are being opposed by the Florida Defenders of the Environment, members of which appeared at recent congressional hearings bearing their report on the canal's impact on the north Florida environment.

FDE was formed last year from a group of scientists and other citizens appalled generally by the exploitation of their state and specifically by the Army Corps of Engineers' barge canal project, which they claim will destroy a wilderness of great esthetic and scientific value (habitat of the endangered Florida panther) and contaminate the Florida Aquifer, from which much of the state gets fresh water.

A canal of one sort or another has been discussed for the past 150 years. In the 1930's construction of a ship canal was actually begun; work was halted after $5.4 million had been spent because of fear of damage to ground water supplies and because it seemed that shippers did not plan to make enough use of the waterway to justify the expense. In 1942 a U-boat-vexed Congress authorized by a one-vote margin a huge barge canal across Florida as a way to ship petroleum from the Gulf to the East Coast out of range of German submarines. There was no question of the canal's being anywhere near economical even then—annual costs would have been more than five times greater than annual benefits.

Other more pressing claims on the available money delayed the canal until its original justification disappeared with German war fortunes, and the project was laid up in a protracted "study." Corps projects never die, nor even fade away. After much reevaluation to show economic feasibility (flood control and land value enhancement had to be cranked in), the way was cleared for construction, which began in 1964.

Like many of the Army's favorable cost-benefit ratios, that for the barge canal is easy to challenge, especially in light of the fact that the canal as planned (and partially built) will not accommodate the new generation of Gulf barge equipment without the time-and-money-consuming necessity of breaking up the tows to go through the locks. The huge cost of allowing salt water into the aquifer, a fairly likely consequence, would certainly overwhelm any economies the canal might be supposed to furnish.

Again, however, the real question is not economic. So much of Florida has been utterly abased by thoughtless commercial development that it seems mandatory to protect the little bit left against destructive exploitation for money. Tourism is one of the state's prime industries and probably always will be, unless the state persists in allowing people to make ugly that which the tourists come to see. For further information write to FDE at PO Box 12063, Gainesville.

BOR RECOMMENDS AGAINST SALEM CHURCH DAM

The Interior Department's Bureau of Outdoor Recreation has shriven itself of an earlier slightly unsavory association with an Army Corps of Engineers' plan that would spoil Virginia's Rappahannock and Rapidan rivers. BOR has recommended against damming the Rappahannock some 6 miles above Fredericksburg on the grounds that outdoor recreation is better served by keeping the rivers free flowing than by damming them. An earlier BOR study under the Johnson administration lent support to the Engineers' contention that the proposed reservoir's flat-water recreation opportunities would be much more valuable than wild-river recreation on the two streams. The Corps estimates that *41 percent* of the benefits of the project will come from flat-water recreation; only with this oversized benefit claim can the project be justified economically.

Last summer Interior Secretary Walter Hickel ordered a general review of the water supply, water quality control, electric power, and other needs of the Rappahannock River basin. The BOR restudy was part of this review. The agency notes in its new report that parts of the two rivers qualify for inclusion in the Wild and Scenic Rivers System; the dam would flood 26 miles of the Rappahannock and 27 miles of the Rapidan.

The project is in fact hard to justify on any grounds at all. The impounded waters would be used for water quality control by low-flow augmentation (29 percent of benefits) and for hydroelectric power production (23 percent of benefits); whatever the recreational value of the flat water and the banks of the reservoir, it would be seriously compromised by drawdown. Low-flow augmentation would be used to flush Fredericksburg's sewage downstream, in this day a recognizably shoddy and ineffective substitute for proper sewage treatment. Virginia is one of the East's lowest priced power markets, so there cannot be a very substantial need for electricity from the project. Flood control for Fredericksburg, the original justification for the project and the one thing for which there is no immediate substitute, now accounts for only 2 percent of the claimed benefits. Water supply accounts for the remaining 5 percent, but the region has plenty of other ways to obtain water.

Congress has ordered the Corps to restudy the project "to determine the extent to which the plan can be modified to minimize any adverse effects on natural values in the area." In light of the new BOR report and of other considerations, it is plain that the plan can best be modified by abandoning it.

HAZARD PARK SAVED

The federal government has dropped its condemnation suit against Los Angeles' Hazard Park, and the city seems likely to grant $100,000 to make necessary repairs after neglecting the park for more than a decade.

Hazard Park seemed doomed in 1964. The Veterans Administration wanted the land for a new facility; the City of Los Angeles was willing to sacrifice for the "higher" purpose a park that seemed to have only neighborhood use. But some citizens were not ready to surrender. They formed the *Save Hazard Park Association* and took up the issue. It seemed like a hopeless cause, but they would not accept defeat.

For 7 years the committee met weekly to review developments and plan next steps in their campaign. Now they have proven that sheer determination sometimes can overcome great odds.

The victors are not dropping their guard, however. A trust fund has been established for legal assistance should any further attempts be made to destroy the park.

Congratulations to the determined members of the Save Hazard Park Association.

NPCA AT WORK

The National Parks & Conservation Association has called upon leaders of a number of conservation groups to join together to form the Environmental Coalition for North America. The coalition is being formed in answer to the need for unity in the conservation movement to deal with some of the larger environmental crises with which we must struggle. The effectiveness of union was demonstrated by the Everglades Coalition in the case of the Miami jetport. (That organization will continue to function until the threat of development to Everglades National Park has ended.)

The first act of the Environmental Coalition was to send a letter to President Nixon calling for a "full public airing of the entire matter" of the proposed Trans Alaska Pipeline System. "All the evidence for and against the pipeline and the various routes under consideration could then be presented; the most highly qualified experts could be asked to testify. A chance would be given to the major conservation organizations to present statements and witnesses and hopefully to question witnesses presented by others.

"As you know, the lands which may be traversed by the proposed pipeline are largely a part of the unreserved public domain managed by the Bureau of Land Management. They are in relatively undisturbed condition, and present an historical opportunity to plan for the management of a large region in the public interest before it passes into state or private hands.

"We consider it essential in the national interest that no permit be issued for the pipeline or any supporting facilities, including roads, particularly in a piecemeal fashion, until the recommended hearings have been held."

The letter recommends that the Council on Environmental Quality be designated to hold the hearings. The letter, released by NPCA President Smith, bears 22 signatures of coalition members and other conservation leaders.

• We reported last month that NPCA was among conservation groups opposing further authorizations for the Central and Southern Florida Flood Control District until the Army Corps of Engineers guaranteed water deliveries to Everglades National Park. Subsequent to NPCA's invited testimony, the House authorization bill was passed by the Senate with an amendment guaranteeing 315,000 acre-feet of water to the park in normal years and a little more than 16 percent of the available water in drought years. House action on the amended bill was imminent at press time.

Upon House approval of the amendment apparently hinged the fate of an-

other bill that would authorize the National Park Service to acquire the remaining inholdings in the park. The Senate Parks and Recreation Subcommittee has deferred action on the bill until park water guarantees can be obtained, even though the most dangerous of the inholdings are not in the eastern part of the park where the water is Army-controlled and therefore subject to a negotiated guarantee. Joe Browder, Washington director of Friends of the Earth, testified on invitation at the hearings for NPCA, the National Audubon Society, the Sierra Club, and FOE.

The inholdings covered by the bill are concentrated in the northwest extension of the park in Monroe County and the east central area in Dade County.

Mr. Browder stated that development of these inholdings constitutes a major threat to the ecological balance of the park. In Dade County, agricultural use of 51 large tracts dividing the area results in pesticide and fertilizer runoff into water flowing southward, which adversely affects the park ecosystem. In 1958 when the disastrous ecological effects of pesticides were not known, the designation of these tracts for agricultural use seemed appropriate. Now, however, it is known that pesticides dislocate fish nurseries and food chains, and that eutrophication is accelerated by the fertilizers carried by water into the park.

Inholdings in the northwest section of the park in Monroe County constitute 52,000 acres that have been subdivided into 3,000 ownerships. Airboats, swamp buggies, and other vehicles cut swaths through the area that will take years to heal. Finally, dredge-and-fill operations are permanently wrecking some wilderness tracts and are disrupting and polluting overland water flows.

• Appearing on invitation at a different hearing of the same subcommittee, NPCA consultant Jonas Morris presented the Association's wilderness plan for Craters of the Moon National Monument. The plan originally was drawn up for the wilderness hearings held by the National Park Service in late 1966. It calls for all but 5,000 acres of the 55,000-acre monument to be designated as wilderness. The remaining 5,000 acres, in the northwest corner of the monument, would be excluded from wilderness status because it is not representative of the monument's other terrain, is criss-crossed by roads, and shows evidence of having been mined.

• The United States Court of Appeals for the Second Circuit has upheld a lower court's ruling and injunction prohibiting the Army Engineers from granting a permit to build a bulkhead in the Hudson River without prior approval by the Secretary of Transportation and without consent of Congress.

We reported in February that the Association had filed a friend-of-the-court brief in the case, involving plans to put a bulkhead as much as 1,300 feet into the Hudson. The bulkhead would support the proposed Hudson River Expressway, which if built would go a long way toward destroying the remaining beauty and serenity of the Hudson Valley. The Corps had granted a bulkhead permit to the New York Department of Transportation. The Corps' authority to do this was challenged in U.S. District Court by the Citizen's Committee for the Hudson Valley and the Sierra Club. The plaintiffs claimed that a permit to build a bulkhead in navigable waters cannot be granted without the consent of Congress and the Secretary of Transportation. The court ruled for the plaintiffs.

The defendants appealed, contending that the plaintiffs had no economic interest in the case and so no legal standing to bring the suit, and that the court lacked the needed jurisdiction. NPCA filed its friend-of-the-court brief at this point. The brief contends that conservation organizations can demonstrate interest, and thus claim standing, without an economic interest in the case. They can do this by showing a bona fide concern for environmental issues that are involved in the case and that Congress is seeking to protect. The brief further maintains that the District Court has jurisdiction under the Administrative Procedure Act to review Corps actions.

The appeals court opinion basically adopts the arguments made in NPCA's brief. The upholding of the judicial standing of the plaintiffs is especially significant. Added to similar recent decisions in other cases, it provides strong precedent for granting environmentalists standing to challenge in court administrative actions that would adversely affect the environment.

• In a letter to Russell Train, chairman of the Council on Environmental Quality, NPCA President Smith has drawn attention to some undesirable conditions in Mount McKinley National Park. Not only is the federally owned Alaska Railroad depot in the park cluttered with unused and unusable equipment, but the depot is being used as a staging point for poachers taking game within the park.

"The Alaska Railroad . . . maintains yards at the Mount McKinley Depot, which give all the appearance of being a junkyard. . . . The National Park Service, as we understand it, seems to believe that it has no control over the situation. Can the CEQ teach the Alaska Railroad what everyone else is learning these days, that the appearance of the environment, and certainly at a national park, is a matter of concern to the American people, and can you get this business cleared up?

"There is reason to believe that persons poaching moose and other large animals within the park are permitted to use the [depot] and transport game through it which has been illegally obtained within the park. Here again the National Park Service appears to think that it has no control over the situation. May we respectfully suggest that the Alaska Railroad be instructed to patrol the [depot] and, in fact, the entire line, to make sure that it is not playing unwitting accomplice to poaching in the park?"

Mr. Smith drew attention to several problems regarding aircraft over the park. He noted that an old Army airstrip was being used 10 years ago for emergencies only. Since then, he said, the Federal Aviation Administration has permitted the strip to be used as a public airfield. The letter asks that the FAA's authority to permit this use be investigated, as the field seems to be in use by flyers who go over the park to harass and kill animals from the air. The letter also asks that NPS policy on flights over the park be determined.

"Mount McKinley National Park is essentially a wildlife protection park. One of its purposes was to provide protection for predators like the wolf, and for the grizzly bear. The protection of wildlife in the park, and the preservation of wilderness conditions there, would appear to us to require the exclusion of airplanes from the park. Once the new highway past the park from Anchorage to Fairbanks has been built, the increase in automobile traffic will be so great that it will be very difficult to protect the park at all. A combination of automobiles and aircraft would probably be fatal."

AFRICA TOUR

Departing September 3 and returning September 25, the NPCA-sponsored tour of Africa will include national parks and game preserves in Kenya, Uganda, and Tanzania. Information is available from the NPCA Travel Desk.

KNOWING-THE-ENEMY DEPARTMENT

R. P. Clinton, president of Clinton Oil Co. of Wichita, Kansas, a company that is planning to build a $90 million refinery at Brunswick, Georgia, with smaller plants at Savannah and Charleston, South Carolina: "We are going to pollute. It's only a question of how much. But, I think, with proper marketing and proper construction we're not going to pollute this area. What we're going to do is contribute to the pollution of the world." He explained that the plant's most gruesome pollutants would be carried by a pipeline a little way offshore and there discharged.

"That was an unwise thing for Clinton to say. It was an arrogant statement!" Interior Secretary Walter Hickel exploded when Clinton's words were read to him in a congressional hearing. "That is the kind of arrogance industry does not need. If they want to challenge me, I'll find authority. They ought to be ostracized for such a statement."

"Can he who has only discovered the value of whalebone and whale oil be said to have discovered the true uses of the whale?"—*Thoreau*

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A child's world is fresh and new and beautiful, full of wonder and excitement. It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood. If I had influence with the good fairy who is supposed to preside over the christening of all children I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength.

Many educational programs now try to nurture that precious sense of wonder; two such programs, initiated by the National Park Service, are described in this issue beginning on page 15.

You can help your Association in its studies of vital environmental issues in several ways: by helping secure new members, by contributing to the Association over and above regular dues, or by remembering the Association in your will. Such contributions and bequests are deductible for federal tax purposes.

National Parks & Conservation Association ■ 1701 Eighteenth Street, NW ■ Washington, D.C. 20009

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