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This Growded Planet

IMMENSE RESPONSIBILITIES devolve on the United Nations Conference on Population which will convene in Bucharest, Romania, in August.

The great programs launched some twenty years ago for the agricultural and industrial progress of the less-developed countries of the world with aid from the advanced countries and the United Nations have not been successful. The poor countries have been forced to expend too large a part of their available capital to meet the mere survival needs of hungry populations.

The so-called demographic transition has not been realized. The hope was that as industrialization advanced, birthrates would fall to match the low death rates brought by modern medicine, and that populations might be stabilized at levels of prosperity. But the mounting populations themselves have too often defeated this hope.

The effort to modernize agriculture and industry must continue, of course, with massive aid from the prosperous world. But it is now quite obvious that the problem of overpopulation must be faced directly, and that only if this be done can the essential economic advances be realized.

T HE RICH COUNTRIES will not fare too badly as to population levels in the next few decades. With about 1.1 billion people in 1970, they may possibly achieve a fertility rate, or an average number of children per woman, of 2.1 by 1975. This is replacement level fertility, and means that in the long run the birth rate will balance the low death rates characteristic of industrial countries, and the result will be a stable population.

On these assumptions, allowing for lag, the industrial countries might stabilize their populations at 1.3 billion by the end of the present century; if the adjustment be slower, at 1.7 billion somewhat later. These levels, while difficult and dangerous, may perhaps be manageable.

It is the poor countries which will suffer most by exploding populations. They had about 2.8 billion people in mid-1973. On optimistic assumptions, they might stabilize at about 7 billion by the year 2050. On more probable and pessimistic assumptions, they might stabilize at about 12.6 billion by the year 2100. Even the lower figures mean poverty, illiteracy, famine, agricultural deterioration, industrial stagnation, and social breakdown; the higher spell utter catastrophe.

I F BY A GREAT EFFORT the world could stabilize its populations more rapidly, and a slow decline could set in, all mothers eventually could expect their babies to survive and their children to grow up in good health and reasonable security. The children could look forward to an education suited to their talents, and to permanent employment in agriculture, industry, or the professions. The elderly could relax in comfort and sufficiency.

In a world where people were in balance with resources, the fields and forests could be verdant and productive again. The oceanic fisheries could produce good food without depletion. The marine mammals might not be hunted at all. The rich wildlife of the pre-industrial world would return to reward the curiosity and admiration of men. The grasses and flowers and orchids, and the interesting and beautiful insects, including the butterflies, which are now so greatly endangered, could be restored in safety to civilization.

OWNS OF MODERATE SIZE could replace the deadly urban conglomerations which are the reflex of rural catastrophe around the globe. The big cities that remained could be made habitable again, because there would be space within them for living. The historic central cities, the shrines and churches which link men to the past, as to cosmos, safe from the flood-tides of crowding, demolition, and socalled development, could be protected and preserved in perpetuity. Artistic, scientific, and intellectual achievement would flower in the great universities which would arise throughout the world on the basis of abundance and leisure. The economic foundations for such a world society would have been laid in an agriculture and forestry bounded by the limitations of the land, and in a factory system fitted to the needs of human communities and the life-support systems and natural resources on which all else depends.

But if the efforts at a prompt reduction of birthrates fail, and at present they are failing, all these great hopes vanish. As we write, famine sweeps the Sahel; hunger marches across the plains of India; drought invades the once wellwatered lands of Latin America. The margin of *Continued on page 35*

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FRONT COVER Sea-cave at Squaw Bay, by Gilbert F. Stucker After more than two hundred years of exploitation of land and wildlife throughout northern Wisconsin, the Apostle Islands, as a recently established national lakeshore in western Lake Superior, are slowly returning to a state of nature, although pollution still threatens the entire area. (See pages 4 and 30.)

BACK COVER Bahaman swallowtail, by Larry N. Brown An adult female Bahaman swallowtail butterfly pauses briefly to sip nectar at a flower along a forested tropical trail. Once thought an occasional stray from the Bahama Islands, this rare butterfly is now known to have an established breeding population in Biscavne National Monument. (See page 10.)

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Shores of the Apostles

Once again the Manitou treads the land of Hiawatha

> article & photographs by GILBERT F. STUCKER

SLANDS are mystical places, but those known as Let the "Apostles," lying off the northern shore of Wisconsin, at the head of Chequamegon Bay in Lake Superior, are altogether baffling. Forested, with rocky cliffs and sandy beaches, good fishing, varied wildlife, and a small population of summer residents, they might seem to be just another lovely archipelago. Their statistics, however, are a shambles, their geography unstable, and their history reads like a fable. They were made a part of the National Park System, as a national lakeshore, only four years ago.

How, when, by, or for whom they were named is a mystery. The early Jesuit missionaries, biblical disciples in mind, might be suspected were there twelve islands, not twenty-two. More likely, they were named for the renegade band of years ago, who, dubbing themselves "The Apostles," found the narrow, winding straits, caves, and hidden coves well suited for hijacking the payloads of local fur traders.

Another mystery stemmed from the historic argument over the number of islands in the group, which varied from twenty-two to thirty-six. Moreover, they seemed to be in a state of continuing flux. Islands came into being, islands vanished-periodically, unaccountably. Wave action, it turned out, was responsible. Long Island was created when Chequamegon Point was breached and separated from the mainland. York was formed when a pair of lesser isles was joined. Another occasion saw an island split in two. Waves destroyed Steamboat in 1898 and are today washing away Little Manitou. What additional happenings of like nature have occurred can only be guessed.

The most remarkable feature of these shores are the caves-sea-caves carved out of the massive Potsdam Sandstone wherever the coast exposes it to the waves. They are especially well developed on Devil's Island and on the Squaw Bay mainland.

T WAS from the shining crescent of Squaw Bay beach that my wife and I launched our first visit into the area in 1966. Shoving off in our blue canoe, the Neechimus, we nosed north along the shore of Bayfield Peninsula toward where the darkly hollowed cliffs could be seen on our right tapering to the horizon. Dead ahead lay Eagle Island, with Sand Island and the rest of the group hidden by the land mass to the east.

Above the gently heaving swells, the cliffs rose, riven and fenestrated, like some ancient, walled Atlantis. From them came a sound as of distant drumfire. Pillars and archways loomed ahead; trees leaned from grassy parapets. We ducked under a low overhang, pulled hard around a truncated spire, and followed along a colonnade. Beneath the rock face, grottoes appeared-shadowy portals to an interior world.

With a thrust of the paddles, we sallied insidethen drew up short. To our amazement, we found ourselves, not in darkness, but in a soft, iridescent void, suffused with moving lights and colors-a kaleidoscope. Sunbeams and the prismatic action of the water created the effect; rays, slanting through the waves and broken up into their component hues, were reflected in shimmering patterns on walls and ceilings-heightened by the varicolored bandings and stains in the rock itself. Ravelings of rainbow gath-



APOSTLE ISLANDS NATIONAL LAKESHORE





ered into whorls, filaments, streamers-combining, dissolving, reforming.

In seeming accompaniment, lugubrious "melodies" resonated through the chambers, produced by the heave and fall of the water as it filled the countless openings in the rock, expelling the air in them. It muttered, groaned, sighed, and gurgled. From an alcove came what sounded like deep breathing, and I thought how Jonah must have felt in the belly of his whale.

Entranced, we moved from cave to cave, noting, in imagination's eye, gothic crypts, altars, sitting Buddhas. A series of connecting rooms reminded us of the Roman baths at Trier. Then suddenly the scale changed, and we were in Lilliput. On a low shelf, the playful water had modeled airy filigrees of stone-goblin palaces where salamanders manned the ramparts and bullfrogs held court.

As we penetrated to deeper reaches, sounds grew muted, and shadows blotted out the light. A crevice, following a fault, led back almost two hundred feet. Velvety silence here, disturbed only by dripping seeps and the lispings of small waves. A line from Wordsworth came to mind: "Beneath some rock, listening to notes that are the ghostly language of ancient earth."

In an adjoining passage we discovered tangible evidence of that ancient earth-ripple-marks registered

Invitation to adventure . . .

What looks at a distance like dark hollows in the cliffs prove to be sea-caves, offering a fantasyland to explore. in the hard sandstone of the ceiling. We found other ripple-marks later in some fallen blocks at the base of the cliff. They told of an inland sea that existed here some 500 million years ago during the Cambrian Period of earth history—a sea whose sands, compacted and solidified, have come down to us in these caverned rocks. For a brief geological time, they will hold their shape, to succumb eventually to the agencies that are hollowing out the caves—to wave and current, temperature change, chemical breakdown reducing them to grains destined to floor some future inland sea.

And so it is with the islands themselves. They, too, are transient, "a phase," as geologist G. L. Collie put it, "in the history of the lake." The remote yesterday saw them as part of the mainland; the geologic tomorrow may see them not at all.

They owe their existence to a subsiding shoreline. Structurally part of the Bayfield Peninsula, they once were hills whose adjacent valleys have been inundated by the lake. All along the southern shore, the fact of this subsidence is manifest in drowned river mouths, submerged rapids, flooded woodlands. The entire Lake Superior basin is tilting. Crustal movement known as "isostatic recoil" is tipping the basin

A kaleidoscope of color and sound . . .

The cathedral-like interior of a large sea-cave at Squaw Bay captivates with shimmering colors and the sounds of the earth—breathing, sighing, moaning.... south by twenty-seven degrees west at a rate of five to ten inches a century.

SO MUCH FOR the explanations of the *paquäbëkiegäs*, as the whiteman geologists were known to the Chippewa Indians. The Chippewa had their own idea as to the origin of the islands: it had happened by accident when one of their lesser gods tried to trap a giant beaver behind a hastily built earth dam. The beaver escaped, but portions of the dam remained—as the Apostle Islands.

The region had been Chippewa territory since 1490 when the tribe migrated from the Gulf of St. Lawrence. Its location was ideal—sufficiently removed from their enemies to east and west, the Iroquois and Sioux, yet "commanding all the routes into the interior...." On the bay shore itself, which British trader Alexander Henry referred to as the "Chippewa metropolis," lived seven different tribes. Superstition kept them away from the islands, except for Madeline, on which the Chippewa resided for a time and then departed because of hostile spirits.

On this protected bay, overlooking the isle-studded arm of Gitchee-Gumee, their Big-Sea Water, many generations of Chippewa lived out their lives, close to the earth-mother, sowing their gardens of corn, beans, and squash; gathering maple syrup along Swamp River; fishing for wall-eyed pike and sevenfoot muskies; harvesting the wild rice of the Kakagan sloughs under the September moon; tending trap



lines; tracking moose, elk, and deer across the winter snows.

Nature was their ally. To birch and cedar they went for bark to cover lodges and canoes; to the spruce, for twinelike roots for stitching and gum to caulk the seams. The ash tree gave tough, flexible wood for paddles and bows. Muskrat bones served as awls; moose ribs, as knives. From the skins of deer and elk came leggings and skirts. Above all, they were indebted to *a-mik*, the beaver—sacred totem, giver of blankets, robes, and choicest meat—whose plews were their principal means of exchange. Ironically, it was this animal that was to signal their end, for it brought into their wilderness the white man.

ALTHOUGH the French explorer Etienne Brule may have been the first to visit the area, either in 1610 or 1622, it was not until Radisson and Groseilliers arrived in 1659 that a viable fur-trading contact was made. Radisson's enthusiastic report stirred the traffickers in peltry back east and, by century's end, a post had been built on the tip of Madeline Island. Becoming known as "La Pointe," it was to figure prominently, for nearly 150 years, in the harvesting of beaver, as that bloody business passed through the control of the early freebooters to the North West Company and finally to John Jacob Astor's American Fur Company.

The wilderness became a field of exploitation; the Indian, a tool in a process alien to his nature. Brother



Earth sculpture . . .

Ripple marks in fallen sandstone blocks attest to the existence of an ancient inland sea that once inundated the entire area. The sand deposited by that sea, compressed and hardened to stone, is now exposed and carved into grottoes and filigreed pillars, spires, and archways at the base of the sheer cliffs of Squaw Bay.



to the forest creatures, knowing and loving them and emulating their ways, now he learned to see them only as skins. Where before he had hunted and trapped to satisfy personal or tribal needs, always leaving enough stock to maintain the population level, now, at the behest of the fur merchants, he stripped without care for the future. Beaver was the target, but no animal with a marketable pelt was spared; and as the fur-bearers were killed off in one region, the guns and traps moved on to the next.

What had been reverenced was betrayed. A way of life, developed and perfected through ages, was abandoned. For the gewgaws of the white man—the "hooch" and colored glass, shiny knives, flashy blankets—the redmen turned against all that they were and had been. For these, they made mockery of the earth-mother. For these they forsook the red gods of nature who held their universe together.

That universe was coming undone. It was as if the Great Spirit, the *Manitou*, was turning from them he whose immanence they felt in the solitudes; who spoke in the wind and thunder, the cry of wolves and birds; who stood in the trees and moved in the blowing grasses; who slept beneath the snows and realized himself anew each springtime. No longer could they hear his voice or discern his presence. The Chippewa had lost his identity with nature, his power to relate. He had grown alien to his wilderness world, a stranger to himself. The spirit of the woods, the *Manitou* was gone.

BY THE 1830s the end of the beaver was in sight. Astor sold out his holdings in the American Fur Company, and its fortunes declined. Rich lodes of copper and iron were discovered to the south and east and opened up, but they had little effect on the Apostle Islands area. La Pointe's population plummeted.

With the disappearance of the beaver went the Indians' final tie to their land. By the treaty of 1854 with the United States government, they became non-persons and were placed on reservations; one group assigned to the Red Cliff locality on the north shore of Bayfield Peninsula facing the islands, the remainder settling in the Bad River section at the foot of Chequamegon Bay.

Now it was the woodlands themselves that began to disappear. Moving up from the south came loggers. With double-bit and crosscut, they went after the white pines first, many four hundred years old and some seven to ten feet across. The red pines went next, and then the hemlocks.

The land of Hiawatha became the land of Paul Bunyan, prey to 55,000 timber strippers whose only aim was to convert trees into lumber. Their methods were ruthless, wasteful, blind. No thought was given the land, the natural community. To get at a single resource, they destroyed multiple resources, even as is being done by segments of the timber industry today. They were of no mind to see that living trees served an indispensable purpose in nature's design, not to be considered in terms of benefit to the human community alone, but to the total community of life, the functioning of natural process. They were not disposed to understand the workings of the hydrological cycle—the inducement and interception of rain, retention of groundwater, regulation of streamflow, transpiration.

The cutting spread northward, following rivers and newly built railroads, moving into the Chippewa reservation lands and beyond. Chequamegon Bay churned with activity. Sawmills sprouted along its banks and at La Pointe. Lumber camps seated themselves on the islands.

In a span of twenty-five years, an excess of 66 billion board-feet of pine went through the Wisconsin mills; and the figure was to increase to more than 103 billion before the "binge" was ended, leaving behind a violated husk of earth no longer capable of supporting the purposes of existence.

Rain, once a benediction, fell as a curse. Trees gone and the forest ground denied its water-conserving capabilities, floods and ravaged lands ensued. Head-

Arrowhead in bloom



water streams, unable to contain the run-off, gutted the earth. Rivers carried washed-out soil, lifeblood of the land, unchecked to the sea.

Came the sun, burning into the earth, sucking up the moisture. Water tables declined. Springs dried up. Swamps vanished. Watercourses became beds of bone-dry boulders. Fire, starting in the slashings, reaped the final harvest.

A few voices were raised in protest, counseling restraint, pleading for *rational* development. As early as 1867, a report was published on the "disastrous effects of destruction of forests in Wisconsin," and in the same year the state legislature launched an inquiry into the matter. But sweet reason could not stay the hands of the exploiters. They were in the saddle, and they believed only in the here and now. They scorned restraint.

THEY STILL SCORN restraint. Nor do the voices opposing them yet speak in unison or with sufficient authority.

A darkness clouds the once-pure waters of western Lake Superior, produced by 67,000 tons of asbestosladen iron ore (taconite) waste discharged daily into the lake. Not only is it short-circuiting natural process and promoting eutrophication, but it is creating a serious health hazard for several communities dependent on the lake for drinking water. It originates at the Reserve Mining Company's processing plant at Silver Bay, Minnesota, and has spread as far as the Apostle Islands.*

How much farther will it spread before it is stopped? Will it ever be stopped? These are the questions being asked. These are the questions being asked throughout the world in connection with similar problems. There are no ready answers. For there is a darkness of another kind with which we must contend, more ominous than that caused by taconite tailings. It is the darkness within us that *continues* to tolerate the destruction of our environment.

The shadows of the past loom large in the cave of the mind. Old patterns of thought and behavior persist. For so long have we lived apart from the community of life, cloistered in our city places, in fear and distrust of the natural; for so long has human development been measured by man's subjugation of nature that we have come to think of it, subconsciously, as the purpose of human existence.

Yet, hope remains. There is a gathering of forces to which we are beginning to move. A new feeling for the earth and its creatures is entering our thinking. We are coming into a realization of the essential unity and interdependence of life.

Nowhere has this sea-change in our attitudes been more encouragingly expressed than in the far-sighted moves to preserve what remains of our once-beautiful earth, moves such as the acquisition of the Apostle Islands by the federal government. First proposed as a national park in 1930, the area, following study, was found unsuitable; the mark of the exploiter, like

* See news item, page 30.

a brand, still lay upon it. Time heals, however. The forest regenerated itself in second-growth pine and hardwoods; wild creatures came back. With the healing of the land came the healing of the people—the ancient ones, the Chippewas. What they observed gladdened them. They appealed to the government to set aside the islands. That was twelve years ago.

Then, in September 1970, chiefly through the inspired efforts of Senator Gaylord Nelson of Wisconsin, the Apostle Islands were designated a national lakeshore by Congress and placed in the custody of the National Park Service. The area preserved embraces some 42,000 acres, includes twenty of the twenty-two islands (sans Madeline and Long) and the eleven-mile strip of adjacent shore containing the Squaw Bay caves. No Indian lands are involved.

Park Service plans stress the recreational potential. Docking facilities, campsites, fireplaces, and Adirondack-type shelters will be built, existing trails conditioned and new ones blazed. Two major campsites for family and group use are slated for Stockton and Sand Islands. On the mainland, a scenic drive is envisioned that will skirt Squaw Bay, with interpretive trails leading from parking overlooks and picnic places. Also on the drawing boards is a visitor center and grounds equipped for tent and trailer camping.

We are faced here with another kind of exploitation, when it is carried too far. Such developments should be held to a minimum and, wherever possible, situated outside the boundaries of the preserve. The scenic roadway should not be built, as it would permit too ready access to the caves, which are fragile structures all too susceptible to human erosion and defacement. The charm of these islands and adjacent shores lies in their natural condition, isolation, and the sense of freedom and release that they impart. It is in wilderness-type camping and hiking that they will serve their greatest good, where a man and his family may, for the space of a few days, enjoy a "Robinson Crusoe" experience. In the process, he might scare up a black bear or two, or a red or gray fox, and possibly a marten. He will see deer. Weasel, mink, and otter make their homes on Outer Island, and brush wolves roam Basswood, type locality of the species.

NOR IS HE likely to overlook the Chippewas. They walk taller these days, and there is a new light in their eyes. Could it be that they feel, in the world's deepening concern for the earthmother, a new hope for themselves? Could it be that they sense, in the Apostle Islands' slow return to nature—the reviving wildlife, restored woodlands, unmolested shores—the return of the *Manitou*, the Great Spirit?

Dr. Gilbert Stucker, a paleontologist at the American Museum of Natural History in New York, is a trustee of the National Parks & Conservation Association and a member of its Executive Committee. He and his wife Alma have canoe-explored the lakes and rivers in many parts of backcountry America.





find refuge in Biscayne National Monument

article and photographs by LARRY N. BROWN

Female Bahaman swallowtail

HE ISLANDS of Biscayne National Monument, Florida, bask in the warm, blue-green waters of the Gulf Stream approximately twenty miles southeast of Miami and eight miles from the mainland. Included in the monument, which is under the supervision of the National Park Service, are Sands Key, Elliott Key, Old Rhodes Key, and many smaller keys. The area came under federal protection in 1972 to preserve the rich and varied tropical marine organisms including fish, corals, seaweed, crustaceans, echinoderms, and other marine life that live in the shallow estuarine waters of Biscayne Bay. However, the biota of the islands in the monument are no less varied than the marine resources. The vegetative cover consists of a dense tropical forest, which is found only in this very small corner of the country and includes such unfamiliar species as West Indian mahogany, gumbo limbo, poisonwood, strangler fig, white stopper, wild tamarind, black ironwood, and tie tongue.

The tropical shores of this island also shelter two of the rarest butterflies native to the United States. Nowhere else, not even with regularity on the Florida mainland, can one find the jewellike Schaus' swallowtail (*Papilio astrodemus ponceanus*) and the newly discovered Bahaman swallowtail (*Papilio andraemon bonhotei*).

The wing coloration and markings of both these rare swallowtails superficially resemble those of the common giant swallowtail found throughout the South. The giant swallowtail is slightly larger than the Bahaman and Schaus', and its larvae, called the orange dog, is often a minor citrus grove pest in Florida. Actually, however, the yellow, orange, blue, and dark brown wing markings are distinctively different for all three species of swallowtail. In addition, the Bahaman swallowtail possesses two slender bladelike tails on each hindwing, giving it a doubletailed appearance. In contrast, the giant swallowtail exhibits only one pair of teardrop-shaped tails, and the Schaus' swallowtail's hindwing configuration is intermediate between the other two species.

Unfortunately, the Schaus' swallowtail has been for several decades one of the rarest and most sought after butterflies for Lepidoptera collectors in this country. Collectors and dealers are at least partially responsible for maintaining a depressed population status for Schaus' swallowtail in southern Florida. Moreover, the species produces only one brood of young per year and is found only in that part of southern Florida extending roughly from Lower Matecumbe Key northward to Key Biscayne. The islands of the Biscayne National Monument fortunately straddle the center of this range of distribution.

The Bahaman swallowtail can be considered even rarer than the Schaus', because until 1972 it had been recorded only once or twice in the Florida Keys and was considered a stray from the Bahama Islands or Cuba. However, in April 1972 a large colony of the Bahaman swallowtail was discovered in the tropical woodlands of Biscayne National Monument by a research group from the University of South Florida. Many of the butterflies had recently emerged from the chrysalis stage, and some were observed laying



eggs in the food plant. It immediately became obvious that the species could no longer be considered a stray, but is a well-established, reproducing member of the Lepidoptera fauna of southern Florida. The species is known to produce a succession of broods throughout the summer in the Bahama Islands, and it seems to behave in a similar fashion in the Florida Keys.

The caterpillars of both rare swallowtails exhibit interesting food plant requirements. The larvae of Schaus' swallowtail feed on the leaves of torchwood (Amyris elemifera), and those of the Bahaman swallowtail utilize the leaves of key lime (Citrus aurantifolia) and sour orange (Citrus aurantium) trees in Biscayne National Monument. Citrus trees are scattered sparingly throughout the junglelike hammocks that cover the islands. These trees are remnants of citrus and lime groves that once thrived commercially in the keys during the late 1800s. Torchwood, on the other hand, is more common and forms an understory shrub or small tree in the tropical hammocks.

EMALE butterflies of both species deposit eggs singly on young leaves at the tips of branches of the food plant. Eggs of both species resemble round, pale green, miniature pearls. They hatch in four to seven days depending on the ambient temperature during the incubation period. Caterpillars vary in coloration with age, but basically they are dark brown with white or gray banding. One band or hood crosses the forward third of the body and the other is located on the anal segments. The general appearance of each larva on the leaf resembles a bird dropping. When touched or disturbed, the caterpillars of both species extend two prominent white horns from a segment just behind the head. These horns emit a pungent odor that probably serves to deter potential predators.

The swallowtail caterpillars molt four times during their life cycle at intervals of approximately twelve days. The mature larvae measure approximately fifty to sixty millimeters at rest and are solitary in their habits in contrast to some Lepidoptera. When ready to transform, each caterpillar wanders about the food plant for a short period, then fastens itself to a twig by means of a silk girdle around the thoracic region and by a silk button at the anal extremity. With the body thus supported in an upright position, a rustybrown or gray colored chrysalis results from shedding of the larval skin.

The pupal stage for the Schaus' swallowtail normally lasts almost a year. In fact, some Schaus' pupae reared in captivity have remained dormant for two years before the adults emerged. The Bahaman swallowtail chrysalis, however, hatches in about two weeks.

HE LIFE SPAN of the adult swallowtail apparently does not exceed one month in either species. In April 1972 large numbers of freshly emerged Schaus' and Bahaman swallowtails were observed throughout the monument. Nearly all the specimens collected or observed at that time were in perfect condition with unworn wing scales. There were approximately equal numbers of each species present in most habitats. One month later, in late May 1972, the islands were revisited. Though still numerous, nearly all specimens of both species were badly tattered and worn, and most specimens flew rather weakly compared to the previous month. Also the percentage of Bahaman to Schaus' swallowtails observed had dropped to roughly 30 percent compared to 50 percent one month earlier.

Evidence of the ability of these butterflies to colonize adjacent keys or the mainland was noted during the survey. On several occasions both Schaus' and Bahaman swallowtails have been seen flying across open water. On two occasions the butterflies were collected with handnets after having been pursued by boat for one-fourth mile or more across Biscayne Bay. On one occasion a Bahaman swallowtail eluded the pursuit and flew safely from the south end of one key and entered the jungle on the northeast side of an adjacent key in a route that covered more than one-half mile. Therefore, it seems certain that movement of these rare species by island-hopping along the chain of Florida Keys occurs routinely. However, inasmuch as both the Schaus' and Bahaman swallowtails have been recorded somewhat sparingly from Key Largo, Lower Matecumbe Key, and almost never on the mainland of southern Florida, these areas could presently be considered marginal compared to the populations located in Biscayne Bay National Monument. The food plants for both species are readily available throughout the middle and lower Florida Keys as well as on the mainland; therefore,





the explanation for their scarcity there is probably related to overzealous collecting activities by man.

The Schaus' and Bahaman swallowtails in the Biscayne National Monument should have a good potential for survival on a long-term basis. The greatest threats to their populations seem to be habitat destruction by man or hurricane and overcollecting by dealers and lepidopterists. Because their prime habitat is now fully under the control and protection of the National Park Service, there seems little chance of total habitat destruction due to man's activities. There is always the possibility of overcollecting, but because a federal collecting permit is required to legally take anything from a national park monument, it should be relatively easy for the Park Service to police Lepidoptera poaching.

Tropical hurricanes that periodically strike southern Florida do considerable habitat damage, but in the case of Lepidoptera it is doubtful that the entire population could be wiped out unless all the food plants were also destroyed. Moreover, the butterflies evolved in this environment and are adapted to the presence of occasional destructive storms.

Another factor that helps to protect the swallowtail populations is the relative isolation of their home islands. Because the Biscayne National Monument can be reached only by boat, pressures from collecting are reduced. Collecting will probably increase, however, if the National Park Service institutes its plan of establishing a regular ferry to the islands of the Biscayne National Monument. Moreover, the National Park Service tentatively plans to construct visitor centers, trails, and various support facilities on several islands in the monument in coming years.

The Park Service has no authority to designate the rare butterflies for any special protection other than the blanket protection afforded all wildlife. This is unfortunate, because the rarity of these butterflies and their special susceptibility to poaching demand extra diligence by park rangers.

ECAUSE of their limited habitat and the im-D pending threat of increased collecting and destruction of habitat due to increased accessibility and development of the islands, the Department of the Interior should list the Schaus' and Bahaman swallowtails as endangered or threatened species. Then the National Park Service would have the authority and the mandate under the new Endangered Species Act of 1973 to fully protect the populations and habitat of the butterflies. Moreover, the National Park Service should reconsider the advisability of building visitor facilities on the islands. Ideally, it would be preferable to keep the islands at the present level of inaccessibility in order to protect and assure survival of their diverse tropical flora and fauna. However, if the Park Service persists in developing the islands, their plans should recognize the rare and vulnerable status of these butterflies and provide for complete protection of their habitat and populations.

Minimal development of Biscayne National Monument would give visitors the experience of an unspoiled tropical island paradise as well as provide unimpaired, protected living space for a unique heritage—two fluttering, living jewels that should be preserved for their own sake and for the delight of generations to come.

Dr. Larry N. Brown holds the position of Associate Professor of Biology at the University of South Florida, Tampa, Florida. His research specialty lies in the field of terrestrial animal ecology, and his major field of investigation deals with the ecology and life histories of unusual animals found in the Florida Keys. He has published more than sixty-five articles in various scientific journals and natural history magazines during the past twelve years.

HELP PROTECT THE RARE SWALLOWTAIL BUTTERFLIES

Readers concerned about protecting the rare Bahaman and Schaus' swallowtail butterflies should write the Park Service and ask them, in planning development of Biscayne National Monument, to put ensuring the survival and health of the butterfly populations foremost in its plans; and also to urge the Office of Endangered Species, BSFW, to list these two butterflies under the new Endangered Species Act of 1973:

> Mr. Ron Walker, Director National Park Service Department of the Interior Washington, D.C. 20240

Rare butterflies in tropical paradise

At first glance the Bahaman and Schaus' swallowtail butterflies might be confused with the giant swallowtail common throughout the South. But closer inspection reveals distinctively different wing shape, coloration, and marking for all three species. Specimens at far left illustrate top and bottom views of the rare Bahaman swallowtail (top), Schaus' swallowtail (middle), and the common giant swallowtail (bottom).

The dense tropical vegetation in the islands of Biscayne National Monument is ideal habitat for the two rare species of butterfly; the Schaus' swallowtail has been virtually eliminated elsewhere in the Florida Keys by overzealous collectors, and until recently the Bahaman swallowtail was not known to breed in the Keys. In 1972 scientists from the University of South Florida discovered a breeding population in the undisturbed woodlands in Biscayne National Monument.

Both species deposit eggs singly on leaves of the food plant—here a Bahaman swallowtail egg on a key lime leaf. Caterpillars of both species have protective coloration resembling a bird dropping, and when threatened they emit a pungent odor to deter potential predators.

WHEELER "Enchanted City" of the San Juans

An area of odd, contorted volcanic formations deep in Colorado's Rocky Mountains deserves wilderness designation by VIRGINIA McCONNELL SIMMONS

IKE an ancient castle sunken into its walls, Wheeler Geologic Area slumbers high in Colorado's San Juan Mountains. Spruce and fir trees invade its interior, past stone sentinels. Rain and frost chip its buttresses, and the wind tosses sand down its chimneys.

A bell tinkles faintly on a sheep driveway a mile away. A pair of hikers scrambles down loose gravel. Smoke curls from a campfire among the trees, and a coyote croons a lullaby to a typical day at Wheeler.

It is surprising that one of our first national monuments should be so lonely, unprotected, and undeveloped. The story of its original designation as a national monument and its subsequent banishment to limbo is complicated both by public interest and by federal policy.

No record can be found of the formations' discovery before 1908, though sheepherders and prospectors had circulated rumors about a place that they called the "Sand Stones" before that time. The site, actually composed of eroded volcanic tuff, was hidden from most views by surrounding mountains, despite its altitude of eleven to twelve thousand feet and its area of about sixty acres. Although explorer John Fremont's fourth expedition came near the area during the winter of 1847-48, his party did not see the formations. Because of severe weather Fremont preferred to detour the mountains but was persuaded by his guide, "Old Bill" Williams, to cross the San Juans via the headwaters of the Rio Grande in what is now Colorado's Mineral County. They became confused by a raging blizzard and were several miles off course when they turned back only a few miles east of Wheeler. Eleven men and more than one hundred pack animals were lost in this disaster.

Later survey parties also failed to observe the formations. No record of the area appears even on the maps produced by George M. Wheeler's government teams, who did geographical field work in Colorado



"Spires and domes, castles and cathedrals, mosques and temples ... a panorama of form and color

from 1873 until 1884. Nevertheless, the contributions from Wheeler's extensive surveys were honored in the naming of the monument.

Under the Antiquities Act of 1906 the President was given authority to set aside by proclamation historic landmarks, prehistoric structures, and objects of scientific or historic significance on government-controlled lands. Accordingly, on December 7, 1908, President Theodore Roosevelt signed a proclamation creating Wheeler National Monument in Rio Grande and Cochetopa national forests, "whereas certain volcanic formations . . . are of unusual scientific interest as illustrating erratic erosion." The management of the three-hundred-acre monument was placed under the Forest Service in accordance with the Antiquities Act's provision that a site be assigned to the federal department most directly concerned with it.

The movement to protect the volcanic formations in this manner had been fostered by local Forest Service personnel and residents of the area. While Frank C. Spencer was supervisor for the Rio Grande National Forest, he had heard about the "Sand Stones." He planned to visit the site in 1907 with a district ranger but was unable to do so. In 1908 Elwood Bergey, who owned a resort at Wagon Wheel Gap on the Rio Grande about eight miles from Wheeler, described his own impressions of the features to Spencer, for Bergey had seen them from a distance. The result of this conversation was a decision made by the two to investigate the place.

The description of their expedition is quoted from Spencer's account, which appeared in 1924 in *The Colorado Magazine*, the journal of the State Historical Society of Colorado:

"Since there was a trail part way up Bellows Creek, it was decided to make the attempt to reach [the formations] by that route, and to explore all the country about its headwaters. As might be expected, our route was not the most direct, nor was it very advantageously chosen

"However, after a long and tiresome day, we came

VIRGINIA MCCONNELL SIMMON





camping trip to the new monument. Horses and in sight of the 'Sand Stones' without any of the party guides for this adventure were to be had at Wagon having suffered any serious injury. It was a truly Wheel Gap, the article advised. Within a few years remarkable sight, and well worth all our discomforts two routes were available, one being a "road" which and labors. There before us, enhanced by the rays of led into a trail up East Willow Creek to La Garita the setting sun, lay the vista of what seemed to us an enchanted city. Spires and domes, castles and sheep driveway and the other being a fourteen-mile trail built by the Forest Service from Creede, a mining cathedrals, mosques and temples, with their fluted town. A cabin, which to this day is the only shelter columns and wonderfully carved friezes, were arrayed at the site, a pasture fenced for pack animals, and in a confusing panorama of form and color . . . a walled-up spring were provided by the Forest Ser-"It was found that the whole region was not 'Sand vice at the monument.

Stone' but consisted of a lava formation of many

different layers or strata of varying degrees of Development proceeded no further even after hardness and different colors' transfer of the monument's jurisdiction to the Na-"It must be seen to be fully appreciated," he contional Park Service in 1933. National crises, poor cluded. From a statement in Spencer's official proaccess, and remoteness that made maintenance diffiposal for designation of the area as a monument, it cult caused this neglect. As a result the status of a is apparent how he expected tourists to reach the monument was terminated in 1950, and the area formations, and Elwood Bergey's hand can be imagagain was made part of the Rio Grande National ined in the proposal. First, Spencer described the Forest, and so remains today. delight of a Pullman trip on the Denver and Rio Since resuming custody of Wheeler, the Forest Ser-Grande Western Railroad's narrow-gauge line to vice has made efforts to extend protection to this Wagon Wheel Gap. Then, because it was probable fragile section of topography. In 1962, for example, that "the Hot Springs Hotel Company of Wagon the protected area was increased from 300 to approx-Wheel Gap, Colo. [would] be willing to construct a imately 640 acres and was withdrawn from mineral good trail" to the geologic site, accessibility would prospecting, location, entry, and purchase. Also, in be assured. Furthermore, he said, because these 1969 it was proposed for special-use classification and tourists would be able to "report to the Forest Service was given the title Wheeler Geologic Area. In conany danger of vandalism imminent," the formations junction with this proposal the Forest Service iniwould be protected. Finally, Spencer offered a tiated plans that it believed would afford greater name-Fremont National Monument-but his sugaccessibility while providing better control. gestion was turned down because of the abundance This phase of management was triggered by an increase in interest in Wheeler after construction of a gravel road was undertaken for timber removal from an area a few miles from Wheeler. Publicity about the formations also had encouraged more travel to the site by way of a four-wheel-drive trail. The increased use resulted in vehicular damage to land in the general vicinity, an increase in litter, and sanita-**J**UBLICITY and development following the destion problems. But, as Frank Spencer had predicted sixty years earlier, the "danger of vandalism imminent" was duly reported by concerned citizens.

of locations already bearing Fremont's name. The decision to set aside the monument was hastened. according to Spencer, by his going to Washington to present the case to Gifford Pinchot, pioneer conservationist and chief forester of the U.S. Forest Service at the time. L ignation were meager, although the National Geographic in the autumn of 1909 presented three In the spring of 1969 a rancher alerted Colorado's pages of photographs and extolled the merits of a

Hundred-foot-tall Engelmann spruce in these photographs give an idea of the scale of these peculiar eroded formations.



congressmen of impending problems at Wheeler; the Forest Service had cut the new gravel road through a corner of his land, which had been condemned for that purpose. He was soon joined by conservationists, who reported damage to the surrounding area by heavy vehicular use during the summer. They questioned the validity of the Forest Service's plans to develop the area for recreational use, and they urged that Wheeler become part of the La Garita Wilderness Area, which adjoins the geologic area. The ensuing debate over Wheeler's fate has been characterized by the chief of the Forest Service as typical of other controversies about roadless areas throughout the nation, with the prevention of the sale of timber being a central issue. If the timber question was indeed germane to Wheeler, this problem received little publicity in the news media.

The immediate consequences of conservationoriented arguments were that the Forest Service closed the land directly adjacent to the formations from vehicular access, tabled the drafting of its recreational-use plans, and halted construction of the new road fourteen miles from the formations. However, the absence of an established roadway was not going to prevent four-wheel-drive enthusiasts from visiting Wheeler, so the Forest Service continued to argue in favor of the new road to make the geologic site accessible to the public while preventing future damage to the terrain by motorized vehicles and to provide the necessary sanitation and safety facilities near the formations.

ILDERNESS SUPPORT also continued, though, and in January 1970 Colorado's senators introduced a bill to add Wheeler to the La Garita Wilderness Area. Citizens had attempted to include not only the geologic area but also large tracts on the three unprotected sides of it, but the bill as written added merely an elbow of land that lay between Wheeler and the existing wilderness. This omission of effective buffers for the formations became immaterial, in fact, for the bill died in session.

Since 1970 Wheeler's status has remained unchanged with the exception of its having been given low-priority classification for study as a roadless area—the Wheeler-Wason Unroaded Area. Visitors still drive fourteen miles over the unimproved jeep trail from the end of the gravel road or pack in on two trails. Only foot and horse travel are permitted within the area itself, and the jeep trail is closed through the muddy spring season. Official designation as a special-use area is pending until final plans for recreational-use facilities are completed. Ironically, these plans remain unfinished because the resources of the Forest Service's regional office are being used to finance current studies required for other roadless areas.

But Wheeler's scientific significance, which once led to its designation as a national monument, and its beauty deserve a more auspicious destiny than deterioration in limbo. It is time to dust off the wilderness plan for Wheeler Geologic Area and provide full wilderness protection by making it part of La Garita Wilderness.

Virginia McConnell Simmons, a historian, and her husband, a geologist, have visited and photographed many of the West's unusual places. Sometimes they visit wellknown places in unusual ways, as she described in an article about Big Bend National Park in National Parks & Conservation Magazine, December 1973.



GEORGE C. SIMMONS



New Hope for Bay Area Wildlife

Establishment of a new wildlife refuge in south San Francisco Bay will assure a natural habitat for myriads of wild creatures

article & photographs by STANLEY MEDDERS

BY THE LATE 1950s the San Francisco Bay bore little resemblance to the pristine paradise the first Spanish explorers found there in 1769. Not only had it been transformed from a wildlife wonderland into a foul-smelling cesspool incapable of sustaining other than the most basic forms of life, but industrialists and land developers were threatening to turn its entire shore into a sprawling urban monstrosity.

Today, thanks to the persistent efforts of a devoted team of South Bay conservationists, there is an excellent chance not only that urbanization of the area will be halted but that the baylands themselves— 22,000 acres of them, at least—will be reserved forever for their natural inhabitants, with nothing more than visiting privileges accorded to man.

The first defilement of San Francisco Bay began as far back as 1800 when padres from Spanish missions innocently waded out through the lush marsh grasses and diked off ponds to supply their tables with salt. The marshes then were luxuriant fields that extended from the bay to the coastal mountains and as far south as San Jose, fifty miles from San Francisco. Millions of shore birds—both year-round residents and the countless numbers that annually traveled the Pacific Flyway—swarmed across the extensive, lifesustaining mudflats.

The bay itself was a crystalline wonderland teeming with life. Rock crabs, ghost shrimp, littleneck clams, and ribbed mussels satisfied the appetites of shorebirds and waterfowl; and striped bass, starry flounder, shiner perch, and white sturgeon lured an ever-increasing number of sportsmen to the area. Playful sea otters abounded in the open water; and in the many brackish sloughs that crisscrossed the marshlands, large colonies of wary harbor seals disappeared noiselessly at the slightest hint of danger.



What the padres didn't realize when they took over such a small part of this vast bay habitat to create their miniature ponds was that they were initiating an industry that would eventually convert 47,000 acres of marshland to salt ponds. This extensive conversion, though, was of minor importance compared to activities that were to take place around the bay later. Although diking off ponds required the destruction of acres of marsh plants that served as protective covering for wildlife and of mudflats vital as food producers, the newly formed ponds soon became important food reservoirs themselves, harboring thriving communities of tiny brine shrimp.

Other industrial and development activities, however, had no such redeeming features. Destroying under the guise of progress, they gradually wiped out nine-tenths of the habitat and all but a very small percentage of the wildlife that inhabited the bay and its 276-mile-long shore.

THE WHOLESALE DESTRUCTION of bay area wildlife began in earnest shortly after the gold rush. By the late 1850s almost all the elk and deer had been packed in salt and shipped off to the gold mines, and the once dense population of clapper rails had met a similar fate. A single hunter would shoot as many as 250 clappers in one day, throwing back into the tidal sloughs the birds he couldn't sell. By 1900 items made of fur and feather had become so marketable that hunters virtually annihilated the bay's populations of fur seals, sea otters, and snowy egrets.

The struggle for survival grew even more difficult between 1930 and 1950 when raw sewage and industrial by-products dumped into the bay destroyed all of its oyster beds, contaminated 90 percent of its shellfish areas, and caused most fish, harbor seals, and black brants either to die out or to abandon the area entirely.

Pollution and the slaughter of wildlife, however, were only part of the bay area's problem. Land filling for industrial and real estate development was equally as threatening to wildlife survival. Filling and diking were responsible for reducing the bay's original 680 square miles by more than 40 percent, and these activities had also wiped out hundreds of acres of mudflats and 225 square miles of natural marshland, leaving fewer than75 square miles and threatening to destroy even those.

S UCH WAS THE BLEAK situation the South Bay conservationists came up against in 1968. Although the quality of bay water had improved somewhat due to the recently initiated secondary treatment of sewage, not only were 400 million gallons of industrial waste and treated sewage being poured into the bay every day, but 60 percent of all domestic wastes flowing into the bay were still receiving only primary treatment—that is, removal of just one-third of the oxygen-consuming wastes. And even though the Bay Conservation and Development Commission (BCDC), formed in 1964, had succeeded in curtailing bay fill, plans were still underway to construct vast commercial complexes and a 7,500-acre community designed to accommodate 100,000 people.

Realizing that developers were rapidly turning the entire bay area into a biological wasteland, a small group of conservationists knew that immediate action was imperative. Led by Arthur Ogilvie of the Santa Clara County Planning Commission, the group formed the South San Francisco Baylands Planning, Conservation, and National Wildlife Refuge Com-



from pristine paradise to polluted pool . . .

Industrial facilities such as this cement plant and these storage silos mar many acres of San Francisco Bay shore, and garbage dumps now fill sites that once were lush fields of nourishing marsh plants. Land fill for industrial and real estate development has reduced the size of the bay and has wiped out 225 square miles of natural marshland.







mittee. Within months, the originally small committee had grown to such an extent that not only was it composed of hundreds of representatives from state, federal, and local agencies and from such varied conservation groups as the BCDC, Sierra Club, Audubon Society, and Save-the-Bay Committee, but it was supported by city councils, planning commissions, boards of supervisors, and professors from almost every city and university in the bay area.

THE PRIMARY PURPOSE of the committee was to thwart further urbanization of the area by establishing a national wildlife refuge to preserve the open space and recreational values in the natural environment of the bay. To carry out this plan, Ogilvie and other committee members attended more than a thousand council meetings. Armed with facts and statistics, charts and brochures, they spoke tirelessly of filling and construction, of waste and pollution, of wildlife and habitat. And with urgency in their voices, they spoke of man's pressing need to renew his relationship to nature and wildness.

Geologists warned against the acute danger of constructing any type of building on filled mudflats because of their vulnerability in the event of an earthquake. Professors pleaded for the preservation of the scant fifty square miles of remaining marshland. The extraordinarily fertile salt marshes, they told their audiences, are the most productive natural areas in our environment. One marsh plant alone, *Spartina foliosa*, or cord grass, produces seven times as much food as any cultivated grain. In addition to their value as food producers, marsh plants serve as protective covering and nesting areas and aid in abating pollution by converting carbon monoxide into the relatively harmless carbon dioxide.

They emphasized, too, that the fetid mudflats,



time to turn the tide . . .

Cord grass (opposite page, top) is the most important plant in the San Francisco baylands. When it decomposes, it releases minute particles, eaten by microscopic organisms, which in turn are eaten by the clams, shrimp, worms, and mussels that supply most of the food for birds. Lush fields of pickleweed (glasswort; opposite page, below) serve as nesting areas for the endangered California clapper rail and as habitat for the rare red-bellied harvest mouse. Once dense fields of these marsh plants covered almost 700 square miles—from the bay to the mountains and all the way to San Jose, 50 miles south of San Francisco. Today fewer than 50 square miles remain. Once the refuge is formed, many acres of bayland can be reseeded with marsh plants.

As early as 1800 man began altering these marshlands when the Spanish padres diked off small evaporation ponds for the production of salt. Eventually the salt industry converted thousands of acres to salt ponds (above, left). Although construction of these ponds destroys vegetation, they do harbor brine shrimp, an important food supply for shore birds and water fowl. Moreover, the dikes serve as nesting areas for Caspian and Forster's terns, which lay their eggs on bare ground, and they provide dry observation and hiking areas for nature lovers (above, right).

Tidal sloughs in the baylands (above) are rich reservoirs of food for the millions of birds that use the Pacific Flyway. Such inland sloughs, once numerous throughout the marshlands, have become scarce due to land fill and diking. Establishment of the San Francisco Bay National Wildlife Refuge Complex will halt further encroachment into the nurturing marshland and sloughs of south San Francisco Bay. though unattractive, play a vital role in the bay's ecosystem. Teeming with minuscule organisms that help support wildlife, the mud also abates pollution by trapping oxygen from the air and transferring it to the water when the tides come in.

Meanwhile, members of the Audubon Society pleaded for the wildlife inhabiting the bay rim: for the mudflat-feeding stilts, avocets, marbled godwits, sandpipers, dunlins, and snowy plovers; for the marsh-dwelling terns, willets, grebes, and teals; and for the herons and egrets that nested in dense clumps of coyote bush. Many local species, they warned, either had been placed on the endangered list or had become extremely rare: the elusive California clapper rail; white-tailed kite; salt marsh song sparrow; California least tern; and red-bellied harvest mouse, a shy species found nowhere else in the world except in the pickleweed areas around San Francisco Bay.

THE COMMITTEE soon learned that it was working against the clock. Because of pollution, the bay had only an average range of 6.8 to 9.5 parts of oxygen per million parts of water (ppm). Because fish and marine life require water with an oxygen supply of at least 4.5 ppm to survive, this left only a scant 2.3 to 5.0 ppm to break down the tons of waste being poured into the bay. What really gave cause for alarm, however, was the discovery that 22 percent of bayland was in the hands of private owners; and this land, because it was closest to the shore and because it contained many of the shallowest areas of bay, was the most susceptible to fill.

Committee members began a relentless campaign of public education. They wrote newspaper articles and sent out brochures, spoke at civic meetings and before groups of young people. They persistently flooded sympathetic Department of Interior officials with letters and telegrams while encouraging everyone interested in the formation of the refuge to write to Congressmen.

By the end of 1968 the Bureau of Sport Fisheries and Wildlife had endorsed the refuge proposal, and by January 1969 the first of the many subsequent bills to establish the refuge complex was introduced in Congress. One such bill, HR 12143, sponsored by local Congressmen and supported by National Parks and Conservation Association and other conservationists, passed both the House and Senate in 1972, pledged to release millions of dollars by 1974 for land acquisition and development. A final bill authorizing the creation of a 21,663-acre refuge consisting of marshes, mudflats, and shallow water in San Mateo, Santa Clara, and Alameda counties was signed into law in July 1973 by President Nixon.

Committee members were busy acquiring small plots of land and exploring all possible ways of obtaining funds for future purchases. The land obtained—some purchased by individuals, some granted by cities—trickled in parcel by parcel: 68 acres in the east bay city of Fremont; 60 acres of sloughs and marshes in Alviso, to the south; 460 acres acquired by the Nature Conservancy. And finally, the State Lands Commission promised to transfer to the refuge approximately 2,000 acres of its prime bay holdings.

EVELOPERS, THOUGH, were not so cooperative, and the committee had to fight constantly to block the construction not only of housing and industry but of a proposed superjet airport on the marshes near San Jose. The developers were persuasive in their arguments that housing and industry would create extra tax revenue, but the conservationists countered that the national wildlife refuge would bring in just as many financial benefits. They used as examples the Crab Orchard, Illinois, and Klamath Lake, Oregon, refuges where visitors spend substantial amounts of money each day, all of which stimulates local economies. Besides, they argued, once a refuge is established, the Department of Interior boosts the economy by aiding local government to the tune of three-fourths of 1 percent of the acquisition costs of refuge land or, if greater, 25 percent of annual refuge receipts.

As the battles raged, conservationists won over more converts than the developers. But just as all problems seemed solved with the millions authorized, the money for the land acquisition was not appropriated in the budget for fiscal year 1974. However, \$6 million is in the administration's budget request for fiscal year 1975, and presumably it will be approved by Congress this summer. Also, more appropriations can be expected in the future.

THOUSANDS OF SUPPORTERS agree with Art Ogilvie when he says: "Once established, the refuge—the only one in the nation so close to a metropolitan complex as populous as the bay area will permanently protect the bay's natural habitat from urbanization.

"It will protect threatened plant and animal life since vast acreage of bayland can be reseeded with marsh plants.

"Not only will it provide people access to the bay and its diminishing wildlife for observation and study; it will offer unlimited opportunities for fishing, hunting, picnicking, boating, and nature tours. In addition, it will serve as an outdoor laboratory for biology and ecology students, and a planned science center will provide ecological and biological research facilities.

"Of perhaps even greater importance, it will assure local residents—and visitors from all over the country—that they will forever be able to explore and enjoy a wild, natural area right in the heart of the giant metropolitan complex around San Francisco Bay."

Stan Medders grew up exploring the shores and studying the wildlife of San Francisco Bay's marshes and mudflats. A high school language teacher, Stan is active in several conservation groups dedicated to preserving the bay, and he has inspired several of his students to attend meetings throughout the bay area to support formation of the refuge.



NPCA has filed suit against the U.S. Forest Service, seeking a declaratory judgment from the courts that the Forest Service is required by the National Environmental Policy Act (NEPA) to prepare and provide the public with statements about the proposals for fiscal year 1976 activities and financing, as well as for every year thereafter. Several other environmental groups are also plaintiffs.

The plaintiffs maintain that the yearly program of the Forest Service, as expressed in the President's budget, should be covered by an environmental impact statement because the program has significant impacts on the national forest environment, including impacts on trees and vegetation, soils, fish and wildlife, air and water quality, and esthetic and recreational values. These impacts, the plaintiffs contend, come under the NEPA requirement that detailed statements be prepared prior to "major federal actions significantly affecting the quality of the human environment." By failing to fulfill its responsibilities under NEPA, the Forest Service is denving a public right.

The suit calls for a declaratory judgment and primarily seeks discussion of alternatives to requested budget levels and public disclosure of information necessary for informed decisions. For instance, there are reasonable alternatives to fiscal 1976 Forest Service proposals. The plaintiffs state that "These alternatives include but are not limited to a higher or lower goal for the volume of timber sales offerings; a speedup or slowdown in the preparation of land use plans for units of the National Forests; higher or lower rates of reforestation on burned over or cutover lands; offering more or less timber for sale from lands which have special environmental value or where the environment is especially susceptible to harm; permitting more or less timber to be harvested by such harvesting techniques as clearcutting; and a greater or lesser level of Forest Service supervision over roadbuilding and timber harvesting by private parties on the National Forests.

Presumably, Forest Service compli-

ance with NEPA in this matter will ensure a role in the decisionmaking process for NPCA members and staff as well as for the general public. Joining the Association as plaintiffs are the Natural Resources Defense Council, the Sierra Club, and the Wilderness Society. The suit was filed in the U.S. District Court for the District of Columbia.

A wilderness proposal for Assateague Island received a hearing recently in Berlin, Maryland. NPCA presented comments. As proposed, the wilderness area would cover 6,500 acres straddling the boundary between the Assateague Island National Seashore and the Chincoteague National Wildlife Refuge. Citing a recreation plan for the Assateague Seashore published by NPCA in 1968, Association spokesman Destry Jarvis offered strong support for the wilderness plan prepared jointly by the supervisor of the seashore and the refuge manager.

NPCA observed that since the seashore was established (1965), the expanded body of scientific knowledge concerning the dynamics of barrier islands has brought about a realization that natural disruptive change may be essential to the maintenance of such an ecosystem's viability. Man's attempts at stabilization of barrier islands have proven costly if not impossible, and man's mechanized recreational activities on Assateague have caused extensive damage to the dune line. These factors provide a strong incentive for establishing a wilderness area on the island. NPCA envisions that a wilderness area at the low-use center of the island should be accompanied by other major shifts in management practices and modes of access to the island. A visitor mass transit system should be provided that is convenient, spacious, and comfortable

enough to eliminate the need for private vehicles on the island. Such a system could include both an open-air minibus system and some mode of water transport from the mainland to and along the island outside the wilderness area.

Opposition to the wilderness proposal came from a local organization of sports fishermen who regard the seven-mile stretch of beach that would be closed to vehicular access by wilderness designation as virtually a private domain inasmuch as it receives less than 1 percent of the total use of the island. Denial of vehicular access to this section of the island would practically eliminate the surf fishing there, spokesmen stated, because the area is otherwise too remote. There would still be another five miles of beach open to vehicles even with wilderness designation.

At the hearing, NPCA also emphasized that a wilderness area on Assateague would be completely compatible with elimination of the trans-island road and the 600-acre commercial development area contemplated in the Seashore Act (see Conservation Docket).

To protect migratory birds, NPCA has again urged the Department of the Interior to issue regulations prohibiting the hunting of such birds in an area while substantial or significant numbers are still nesting in that area.

NPCA first made this request more than a year ago in conjunction with our comments concerning the Interior Department's proposed rules on "Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife." When final regulations appeared, however, suggested changes had not been made. NPCA would like to know why its proposal was not accepted.

In most areas and for most species, the regulation NPCA is proposing would in no way alter the current hunting seasons. Perhaps the only al-

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Budgeting the priorities for our national parks

npca recommendations

The National Park Service's budgetary needs have received rough treatment from the President's Office of Management and Budget, as reported in detail in a recent staff report. (See "Our Natural Resource Agencies in Trouble," May 1974.) In order to counter the trend toward insufficient funding for natural resource matters, NPCA has become involved in the budget process for 1975. In April the Association testified on invitation at Congressional hearings concerning the Department of the Interior appropriations. Major NPCA recommendations, as presented on invitation to both the House and Senate Interior Appropriations Subcommittees, are summarized here.

Operation Funds. The 1975 budget request for the National Park Service included a total of \$210.058 million for operation of the park system. However, when annual pay increases and General Services Administration rental costs are subtracted, the total is \$201.937 million, which represents only a 4.5 percent increase over the operating budget for 1974.

This increase is not sufficient to meet the needs of a growing park system and to bring parks up to standard in the areas of interpretation, maintenance, security, safety, and resource management, or to keep pace with inflation.

Planning and Construction. Planning and construction allocations in the budget request are heavily biased toward developments for the Bicentennial Celebration of 1976, for which Park Service spending would amount to a total of \$54.2 million out of \$57.303 million allocated for planning and construction. Although NPCA recognizes the Bicentennial's signifi-

cance to our nation, this allocation inflicts a severe drain on the Park Service operating budget. The seriousness of such a drain is demonstrated by the fact that the Park Service has proposed a contingency manpower system, implying an overall inadequacy in staffing. NPCA recommended, therefore, increasing the operation funds for the National Park System by \$54.2 million to compensate for the impact of Bicentennial planning; supplemental appropriations could then be allocated to specific Bicentennial projects.

National Visitor Center, NPCA particularly objected to the requested allocation of \$8.680 million as the Park Service share of the cost of a parking structure at the Bicentennial National Visitor Center to be located in Union Station, Washington, D.C. This would increase visitors' dependency on the automobile and add to urban congestion. Spending priority should be shifted to historical rehabilitation and preservation work on Union Station and other structures. Visitor parking needs would be reduced if the District of Columbia spent funds to subsidize an adequate mass transit system to serve Bicentennial visitors.

Road Construction and Alternative Transportation Systems. In keeping with our policy stance on public transit as related to the parks, NPCA recommended reduction of the \$33 million NPS road maintenance and construction budget request. Roads bring automobiles; and automobiles bring pollution, congestion, litter, and uneconomical energy use to parks. NPCA recommended that funding emphasis be shifted to subsidizations of alternative public transportation systems. NPCA therefore recommended that the \$4.608 million included in the budget request for alternative transportation systems be doubled, and that the \$33 million for road construction be reduced by \$4.6 million. NPCA commended the National Park Service for its progress on these systems in recent years. Fourteen areas of the park system are now served by mass transit systems, many of which are free to the public.

Concessions. NPCA testified that the National Park Service needs to develop a policy on concessioner operations inside the national parks because concessioner-operated tourist facilities often degrade the wilderness environment in our parks, because concessioner companies can be monopolistic, and because concessioner goals can conflict with NPS administrative policies. (See "Concessions: A continuing threat to park quality," in the March 1974 Magazine.) The Association requested that a projected economic feasibility study on concessions be restructured to include regional planning studies based on recreation, ecology, transportation, and existing adjacent land use patterns. In this way, developments could be geared to meet the needs of visitors while minimizing the impacts on the parks. Many visitor services could be allocated to staging areas outside the parks, which would reduce National Park Service costs in the long run.

Growth and Decentralization. Recent trends toward decentralization of the National Park Service staff, particularly in regard to regional office subdivisions, have apparently been ineffective and have resulted in cumbersome bureaucracy, NPCA stated. The decentralization has drawn personnel away from useful park administration functions and channeled personnel into bureaucratic functions.

Although the Park Service may need as many as 1,200 new permanent staff positions to properly run the growing National Park System, the Office of Management and Budget is maintaining a "manpower ceiling" on the Park Service. NPCA requested that OMB lift this ceiling to meet the need for adequate staff levels.

See "The Land and Water Conservation Fund" on the facing page.

At press time the fate of the NPS budget for 1975 had not yet been decided by Congress. Future issues will bring readers up to date.

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teration would be in the opening date of the dove season in some areas. At any rate, a two-week to one-month delay in the date of the opening of a dove season seems to be precious little hardship for ensuring maximum reproduction and wise management of a renewable natural resource.

NPCA urged the Department to publish for comment our proposed rule. We look forward to working cooperatively with Interior personnel.

The title of the Alexandria waterfront on the Potomac River in Virginia is presently the subject of a court debate, with both the federal government and



the city of Alexandria claiming ownership. If federal ownership is established, the waterfront will continue to be administered by the National Park Service as open space, and historic buildings will be restored. If the city claims the waterfront, private development will be encouraged, including row houses, condominiums, shops, and an urban park.

In early May NPCA appeared before Congress on invitation, for the third time in two years, to express concern for the future of this waterfront area.

Legislation (HR 14043) has been introduced by Rep. Stanford Parris of Virginia that would immediately designate the narrow forty-eight-acre riverfront strip as belonging to Alexandria. The bill outlines extensive development guidelines, including housing density levels and other construction details. The bill even proposes declaring part of the Potomac River a nonnavigable waterway in order to avoid Corps of Engineers restrictions on dredge-and-fill operations on navigable rivers.

Presenting testimony against the Parris bill, NPCA objected to the disposal of lands held in the public interest for private profit. Many segments of the public would feel the loss, including millions of tourists visiting the Washington area, and the residents of Alexandria. NPCA specifically opposed the inclusion of a loophole designed to circumvent the siltation restrictions for navigable waterways.

NPCA stated that high-cost developments not only would spoil the riverfront, which is now used largely as a public park, but also would violate sound environmental planning concepts. Because the waterfront is part of the floodplain for the Potomac River, and because flooding is a regular event in such locations, only minimal development concepts are appropriate for this area. Therefore NPCA supported retention of federal ownership and administration of the Alexandria waterfront strip by the Park Service.

The Land and Water Conservation Fund merits the full support of Congress in the determination of 1975 appropriations, according to NPCA testimony presented on invitation during hearings on Interior Department appropriations.

The land acquisition backlog for the Department of the Interior now amounts to staggering financial levels. The National Park System, after eighty-three years of federal administration, is still not fully owned by the public. NPCA pointed out that the National Park Service (NPS) needs to acquire 46,000 acres of private inholdings in fifty units of the park system at an estimated total cost of \$100 million. This is an important priority because private ownership of land within a national park or monument can result in land use compromises that are contrary to the public's interest in maintaining a quality environment, and that violate NPS administrative policies. In addition, the Park Service now needs another \$227 million to purchase lands in recently authorized new national park areas, and at least \$236 million would be needed to acquire the acreage covered in pending legislative proposals.

Appropriations for the federal allotment of the Land and Water Conservation Fund should be considered in the context of these needs. At no time in the last three years has Congress appropriated the full amount available for appropriation in the Fund. The worst year was 1974, when, with \$338.5 million available, only \$76.2 million were actually appropriated for use by the Department.

Again, in the context of existing needs, the departmental budget requests do not reflect a high priority for aggressive spending on natural resource protection. For fiscal year 1975 the Park Service expects to receive only \$71.5 million under the current administration planning process.

Due to a carryover of \$262.3 million from fiscal 1974, there are currently \$562.277 million available for appropriation by Congress. NPCA recommends that the Congress appropriate the full amount for the Land and Water Conservation Fund for fiscal 1975. This recommendation is supported by the tremendous backlog of land acquisition needs and the viability of pending legislation for new areas. Furthermore, NPCA explained how the states, in administering their portion of the Fund, have acquired the planning capability to handle an increased allotment. Various factors indicate that substantial increases in the Fund allocations will soon occur. In view of the need to plan for the administration of a much larger fund in the years to come, an intermediate increase for 1975 would greatly assist various administrative bodies.

Federal spending for the acquisition of lands urgently needed for recreation and conservation purposes is not inflationary spending, NPCA spokesman Toby Cooper emphasized. Rather, it is a true investment in the well-being of all generations and in the protection of diminishing wildlife habitats and open space.

A billion dollar precedent is at stake in the consideration of proposed legislation that would compensate permit holders for loss of certain privileges for private use of national forest lands, which belong to the public.

Testifying on invitation recently be-





fore the Subcommittee on Forests of the House Committee on Agriculture, NPCA voiced strong opposition to HR 3174, a bill that would grant a "possessory interest" to any person who has acquired or constructed any structure, fixture, or improvement on any lands of the national forest system.

A possessory interest is a legal term referring to a property right and requires reimbursement for the taking of the interest. The possessory interests established in HR 3174 would consist of all incidents of ownership except legal title. Thus the U.S. Forest Service, which in the past granted temporary permits for vacation homes, could be put into the position of having to compensate the permit holders for any expiration or termination of permits for lands that are needed for public uses. Although the primary thrust of the bill is to provide a possessory interest in relation to vacation homes in the national forests, it has been estimated that if this proposal became law, it could establish a precedent applying to approximately 86,000 permits covering some eighty different uses of national forest land. Permittees have constructed improvements valued at more than \$1 billion on those lands.

According to NPCA's staff forester, Tom Cobb, "It is very difficult to rationalize why the citizens of this country should be put in the position of having to possibly compensate persons with permits for private vacation dwellings on the national forest lands when such dwellings serve no public need or purpose, and particularly when such persons constructed or acquired their dwellings under standard and accepted terms of agreement with the U.S. Forest Service." The Forest Service is no longer issuing permits for vacation homes and in some instances is giving ten to twelve years' notice to

existing permittees in cases where the use of the land is needed for other multiple and sustained-yield objectives of management.

NPCA's concern with the preservation of Yellowstone National Park's natural environment forms the basis of our interest in a 21-mile highway improvement being proposed by the Department of Transportation (DOT). DOT has published a plan for public and interagency approval of a segment of the proposed highway improvement, Thornton to Twin Groves (Idaho), on the existing alignment U.S. 20-191. DOT acknowledges that the proposal is designed to facilitate automobile travel to Yellowstone and states that the volume of park-oriented traffic justifies the new highway.

After judging the present highway inadequate, DOT presented several possible alignments for the improved highway. However, DOT considered no alternative other than doing nothing and leaving the existing highway intact.

NPCA is opposing the project on the basis of the impact of automobile traffic on Yellowstone and the inadvisability of imposing new highways on our rural landscape. In a statement to both DOT and the Idaho Department of Highways, NPCA rejected the proposal's inadequate research on potential environmental impacts. NPCA pointed to detrimental environmental, social, and economic effects of the project and cited numerous problems with expanding our dependency on automobile transportation. NPCA also noted the existence of a railroad bed that not only runs parallel to the proposed highway alignment, but reaches the national park. This railroad did not factor into the environmental impact statement (EIS).

Úpgrading and use of the railroad would greatly reduce the air and noise pollution, litter, and inefficient energy use associated with the automobile. Railroad transportation also would correlate with National Park Service efforts to provide mass transit systems for visitors inside many parks.

NPCA members are urged to write to DOT and express their views. Write to Omar L. Homme, Division Engineer, 3010 West State Street, Boise, Idaho 83703; or Mickey Klein, Office of Environmental Affairs, Department of Transportation, Washington, D.C. 20590. NPCA will send any member a copy of the comments on the Draft EIS upon request.

Lying north of Yellowstone National Park on national forest lands are the beautiful Absaroka, Cutoff Mountain, and Beartooth primitive areas. NPCA recently submitted a statement to the U.S. Forest Service endorsing its proposal to designate the three primitive

A CITIZEN'S VOICE IN GOVERNMENT

Organizations like the National Parks and Conservation Association, which enjoy special privileges of tax exemption, may not advocate or oppose legislation to any substantial extent.

Individual citizens of a democracy, however, enjoy the right and share the responsibility of participating in the legislative process. One of the ways citizens of a democracy can take part in their government at state and federal levels is by keeping in touch with their representatives in the legislature; by writing, telegraphing, or telephoning their views; by visiting and talking with their representatives in the national capital or in the home town between sessions. Every American has two senators and one congressman with whom he may keep in contact in this manner.

The best source of information for such purposes is the official CON-GRESSIONAL DIRECTORY, which can be bought through the Government Printing Office, Washington, D.C. 20402. It tells you who your senators and congressmen are and lists the membership of the various Congressional committees. It also gives full information on the personnel of the various executive bureaus of the government whom one may contact about administrative programs and policies.

The CONGRESSIONAL DIRECTORY for the First Session of the 93rd Congress is available in three editions, prices of which include postage: bound in hard cover, \$6.80; paperback, \$5.50; and thumb-indexed, \$9.35. areas as wildernesses and recommending inclusion of important contiguous areas as well.

Wilderness designation would protect a variety of unusual and unspoiled topography, including the largest expanse of high altitude tundra plateau in the country, which is located in the Beartooth area. It would also protect habitat of wildlife such as elk, black bear, grizzly bear, and wolves whose ranges extend into the areas from Yellowstone National Park, as well as that of nonmigratory moose, bighorn sheep, and mountain goat. The areas are located within Gallatin and Custer national forests in Montana and Shoshone National Forest in Wyoming.

NPCA has won a major victory in a controversy over the operation of concessions inside the National Park System. The controversy arose from efforts by NPCA to gain detailed financial information, including profit and loss statements, concerning seven concessioner companies operating in twelve areas of the National Park System. Initially, the Interior Department refused access to this material, and because of the apparent efforts to keep the data secret, NPCA filed suit under the Freedom of Information Act to compel disclosure.

The decision favoring NPCA's position was handed down April 24 by the U.S. Court of Appeals for the District of Columbia Circuit, reversing the District Court in the case of National Parks and Conservation Association v. Rogers C. B. Morton, Secretary of the Interior, et al. The District Court had rejected NPCA's claim on the grounds that the information was confidential because it was not customarily released to the public by the concessioners. NPCA appealed the decision, contending that concessioners operate as virtual monopolies in the parks and receive statutorily preferential treatment in renewing their contracts. Accordingly, disclosure of the information could not threaten the competitive interests of the concessioners.

The U.S. Court of Appeals agreed with NPCA's position and ordered the case sent back to the District Court, directing that further proceedings be held to determine "whether public disclosure of the information in question poses the likelihood of substantial harm to the competitive positions of the [concessioners] from whom it has been obtained." A. W. Smith, President and General Counsel of NPCA, said, "We are pleased with this decision. It reflects the need for more careful scrutiny of the companies which operate in our national parks, and it represents a major step toward ensuring the preservation of the public interest in the management of concessioner operations."

NPCA was represented in the appeal by Richard B. Wolf, with Victor H. Kramer and John F. Dienelt supporting the brief. All three are attorneys associated with the Institute for Public Interest Representation, a public interest law organization affiliated with Georgetown University Law Center that particularly directs its attention to the operation of federal agencies and departments to ensure that the public interest is recognized and implemented in the practices and decisions of those agencies.

by Arian Singh The story of one man's efforts to defend the beautiful animals who can no longer defend themselves. "A really splendid book," reports the London Times. Singh's attempt to preserve, as part of India's heritage, the tiger, the chital, the sambhar, leopard and marsh crocodile, and to build up what may possibly be the last herd of swamp deer in the world... is a continual battle against the indifference of politicians and the active hostility of farmers. Some wonderful stories of his sanctuary in Northern India, and even more wonderful photographs, which he took himself." Profusely illustrated in color and black-and-white, \$8.95 at bookstores. Harper & Row National Parks and Conservation Association Attention: Tiger Haven Wildlife Trust 1701 Eighteenth Street, N.W. Washington, D.C. 20009 Gentlemen: Please send me Tiger Haven by Arjan Singh. I am enclosing \$..... for copy(ies). I understand that 40% of the \$8.95 selling price of the book, or \$3.59 is a contribution to NPCA's conservation efforts and is therefore deductible for federal income tax purposes. NPCA is actively engaged in support for the Tiger Haven Wildlife Trust and other exciting conservation programs at home and abroad. Name Address CityZip Please make checks payable to National Parks and Conservation Association.



Every day 67,000 tons of iron ore wastes are dumped into Lake Superior. What may offer future barristers an example of landmark legislation in the matter of the public interest vs. corporate privilege has been taking shape in a Minneapolis courtroom. There, the U.S. Department of Justice, the Environmental Protection Agency, and the states of Minnesota, Wisconsin, and Michigan have been contesting the "right" of the Reserve Mining Company of Silver Bay, Minnesota, to pollute the clean waters of the lake. Federal District Judge Miles Lord presided over the litigation.

In operation since the mid-1950s, Reserve, which is owned jointly by Armco and Republic steel corporations, is discharging the iron ore (taconite) waste into the lake at tremendous rates despite mounting evidence that the practice is detrimental not only to the lake's ecology but to human health. Studies show that the effluent contains tiny asbestos fibers, which are entering the water systems of lakeside communities and can pass through body membranes into the blood and lymphatic systems and trigger cancerous growths.

In April, after a six years' effort to persuade Reserve's officials of the need to convert to on-land dumping that climaxed in a nine-month trial. Judge Lord suspended the firm's operations. Although the company pointed to the loss of work by 3,100 employees, the judge accused Reserve of stalling on plans to dispose of wastes on-land because that would cut profits. He had given the company a chance to stay open by submitting a plan to eliminate pollution, but the company did not submit a plan. He charged that the company could easily afford large capital outlays to abate air and water pollution.

The judge concluded that it would be wrong to expose about 200,000 people of Duluth and other communities to the hazard "in order that the people in Silver Bay can continue working at their jobs."

Forty-eight hours after his decision, however, the dumping was resumed when the 8th Circuit Court of Appeals granted the company a temporary reprieve pending review. On June 4 the appeals court ruled that the discharge does not pose an immediate health threat but dictated a timetable for cleanup, leaving the company free to keep dumping for at least another seventy days.

One of the Apostle Islands recently faced the threat of destructive logging operations. Senator Gaylord Nelson of Wisconsin announced that he had initiated action to prevent logging (possibly clearcutting) on the 319-acre York Island, a privately owned island designated for acquisition in the law that created the Apostle Island National Lakeshore.

Nelson said that the National Park Service reported in mid-May that it had discovered that logging had just begun on the island in Lake Superior despite the fact that a Park Service assessment found that the timber has no commercial value. NPS had been negotiating York Island's purchase; however, the logging threat prompted initiation of a condemnation action. The Senate and



House Interior Committees and Justice Department officials quickly cleared paperwork to allow NPS to assume title to the land. (See "Shores of the Apostles" and the map showing York Island on page 4.)

The highest point on this continent has been treated like a dump by many mountain climbers, according to the coordinators of an environmental cleanup project focused on Mount McKinley, Alaska.

The Denali Arctic Environmental Project (DAEP) was conceived at the University of Oregon. (Denali is another name for the 20,320-foot-high McKinley.) In the past several years participants on several DAEP mountain-climbing expeditions have collected, burned, and carried out litter and many kinds of garbage and wastes found on the popular West Buttress approach to the summit of Mount McKinley; the expeditions also have tested and developed various expeditionary mountaineering environmental practices. Living on the mountain for extended periods under severe conditions, DAEP people were able to move the necessary food, personal equipment, and spare equipment up the mountain to successfully gain the summit in addition to conducting extensive cleanup activities. Furthermore, through careful planning and preparation, they proved that it is possible without hardship to leave nothing on the mountain and also to carry off a substantial amount of litter left by other expeditions.

Late last year DAEP published a report identifying areas on the West Buttress Route that still have serious environmental problems and suggesting solutions to food, litter, and human waste problems encountered on expeditions. The report also recommended that McKinley National Park personnel promote certain preventive measures and help organize cleanup and publicity programs. The Park Service recently incorporated the report into literature issued to all prospective climbers applying for a permit on Mt. McKinley. With the support of park personnel, DAEP plans more comprehensive projects at Mt. McKinley for the winter of 1974–75. And with sponsorship from organizations such as the American Alpine Club, DAEP has distributed the report to most major climbing clubs and organizations throughout the world. Organizers thus hope to have some impact on similar pollution problems of mountain ranges in other areas. As an example, the U.S. Forest Service recently announced that it has been forced to limit the numbers of persons per day that may have access to Mt. Whitney in California because the wilderness character of that mountain is also being threatened from overuse.



HARRISON H. HILBERT

Denali Arctic Environmental Project Coordinator Gary Grimm prepares to burn some of the paper litter found at 17,200 feet on the way up Mt. McKinley in Alaska. Irresponsible climbers had also left surprising amounts of garbage, abandoned food and equipment, human waste, and plastic on the mountain; these items often had to be chopped out of ice.

A HUD-insured energy project in the Summit Plaza Apartments in Jersey City, New Jersey, will demonstrate and, for the first time in the United States, evaluate the economy, efficiency, and reliability of a total energy system as compared to conventional energy plants. The U.S. Department of Housing and Urban Development (HUD) is involved in the energy field because housing accounts for one-third of the energy consumed in the United States. Other total energy plants exist in this country, according to HUD Assistant Secretary Michael H. Moskow, but none has produced a scientific evaluation of cost and reliability from design through long-term operation.

Total energy basically involves getting the most out of every drop of fuel used to generate power. Typically about 70 percent of the heat from an electric power plant's burning fuel is discharged into the air or into lakes and rivers. A total energy system, on the other hand, puts this waste by-product to use by rechanneling it through the system.

"It operates somewhat like your automobile engine when you use the heater," Mr. Moskow explained, "except that the total energy system recovers waste heat, or exhaust, as hot water and uses it to heat buildings or cool them with absorption air conditioners."

At full operation, the total energy plant will produce on site enough electricity, heat, hot water, and air conditioning for 486 apartments, a school, and a commercial area within the Summit Plaza Apartments.

HUD experts predict the total energy system will knock one-third off the amount of fuel needed to service the site conventionally, and cut 25 percent from the annual cost of operating and maintaining a conventional utility plant. Additionally, a total energy system can be expanded as needed to serve a growing development.

HUD's total energy system was built entirely from available components.

The total energy system and the development have been designed and built to serve as a national energy test facility. For example, the plant will be able to evaluate new generating systems, in actual service, as they are developed by industry. Future plans call for installation of an incinerator with waste heat recovery to recycle trash generated within the development into useful energy. Furthermore, the commercial building serviced by the total energy plant has been designed for use as a test building to evaluate the potential of solar energy systems.

Expanding on the total energy concept, HUD has initiated the multiagency MIUS program to meet foreseeable shortages in utility areas, as well as energy. The MIUS (Modular Integrated Utility System) is designed to supply not only the normal range of



utilities—electricity, air conditioning and heating—but also can treat water, process solid wastes, and treat liquid wastes, and will use residual and recycled energy to do a large part of the job.

New projects using solar energy to heat and cool buildings are making the news as solar "firsts." The "first largescale" building to be designed with a built-in solar energy system for heating and cooling has been designed for the Madeira School in McLean, Virginia. When built, the structure is expected to produce practical information about technical and economic factors. The regents of the University of Nevada are planning a desert biology facility that reportedly will be the nation's first major building to be heated and cooled completely with solar energy, according to the Los Angeles Times. The Desert Research Institute would cover 6,374 square feet in Boulder City using existing technology. An electrical energy shortage provided impetus for the project. The lab's roof faces south, slanted at a 45-degree angle to the sky, and is covered with 6,000 square feet of solar collector plates. Most of the latter will be used for heating and cooling while the remainder will be used for research.

The world's largest solar heated and cooled structure might be a proposed building on the New Mexico State University campus. This building would use only 21 percent as much energy as a building heated and cooled by conventional methods and would save \$2,535 annually based on 1973 electrical rates.

More than twenty experimental solar heated structures have been built and operated in the United States by private entrepreneurs, according to a study by several Atomic Energy Commission staff members earlier this year. The study says there are no technological barriers to solar domestic water heating, solar space heating, or solar space cooling. The only barrier to present use is that such systems are not now developed to be economically competitive. The study recommended a five-year, \$850-million program to develop this technology to the stage of commercial application.

The National Science Foundation and the National Aeronautics and Space Administration issued a joint report last year recommending a total of \$3.52 billion for solar research and development over the next fifteen years, stating that solar energy could be in common use for heating homes within five years, for cooling homes in six to ten years, for producing synthetic fuels in five to eight years, and for producing electricity in ten to fifteen years. These recommendations went through a review process led by Atomic Energy Commission Chairman Dixie Lee Ray.

Speaking in his capacity as Chairman of the Scientist's Institute for Public Information, Dr. Barry Commoner contended earlier this year that solar energy funding has been insufficient and that the AEC, despite recommendations of government experts, has downgraded the feasibility of solar energy in order to place greater emphasis on development of the nuclear fast breeder reactor. Dr. Commoner is on the NPCA Board of Trustees.

The administration's funding commitment for solar energy research and development in the new fiscal year Energy Research and Development appropriations bill is \$50 million. The major portion of energy funds will go to the Atomic Energy Commission for research and development of controversial nuclear fission. However, the Solar Home Heating and Cooling Demonstration Act of 1974 passed the House and Senate and was in conference at press time. [See August Conservation Docket.]

The tail of Ouroboros has been adopted as a symbol for resource recycling and energy conservation in our finite world by an environmental design project at the University of Minnesota. Ouroboros is a mythological dragon that survives by eating its own tail. For over a year 150 students have been studying architecture's role in energy conservation through the research, design, and construction of a 2,000-square-foot, two-level house. The house incorporates energy conserving wall and window insulation, solar water and space heating, a windmill to generate electricity, and sewage and water recycling.

Architectural and engineering students designed the trapezoid house so that the largest wall faces south, thereby maximizing collection of solar energy in the windows and solar flat plate collector. Side walls taper back to a small northern wall to reduce heat gain in summer and heat loss in winter.

Earth removed for the basement is pushed back against the north, west, and east sides to further reduce exposure, and to raise the frost line by four feet. Another feature, a sod roof, is designed to help insulate the house during winter, and to cool it during summer through evaporation of water. A small greenhouse attached to the south wall provides beauty and food.

The south-facing roof of the house incorporates a 700-square-foot "Thomason" flat plate solar collector. Essentially, two sheets of glass cover a sheet of corrugated galvanized steel into which water is dripping. As water washes down the metal pan, heat is absorbed, raising the temperature 20°F. Water is then drained to basement storage tanks that are surrounded by crushed rock. Air pulled through the rock by a conventional forced air system is heated by radiation and then supplied to the rooms above.

A unique wind generator that is being built next to the house is theoretically expected to produce all of the power required. It will use a two-blade high speed propeller 15 feet in diameter. Excess energy produced will be first stored in long-lived batteries in the basement, with resistance heating coils in the hot water storage tank soaking up any additional excess energy produced.

Project Ouroboros also seeks to conserve water and recycle wastes. Thus, the house includes a composting toilet that uses bacteria to break wastes down into fertilizer for use in gardens and the greenhouse. This system, known as the clivus multrum, has been used extensively in Sweden.





Congress is continuing to work on a number of unresolved issues of environmental significance such as land use, strip mining, the BLM Organic Act, predator control, solar energy, Big Cypress, Big Thicket, the California desert, Grand Canyon National Park expansion, Eastern Wilderness, toxic substances, and reorganization plans. Increasingly, the likelihood of action on these and other measures becomes a function of time and priorities-with the customary early election year adjournment of the session as a key factor, complicated further by the proposed House Committee jurisdictional realignment, and numerous election year holidays. As this issue is published, there could be as few as two to three months of the 93rd Congress remaining for substantive action.

In addition to measures that have received attention in Congress, several of significance to conservationists have not; these include:

Potomac National River: After a number of years of controversy and inaction, efforts to establish the Potomac National River in Maryland, West Virginia, Virginia, and the District of Columbia have been revived. Rep. Gilbert Gude (Md) has introduced the bill, HR 12785, to protect at least 200 feet of river shoreline along both banks of the Potomac from Cumberland, Md., to Washington, D.C. Altogether, the bill would add 14,678 acres to the existing 29,830 acres in federal, state, and local parklands along the river. Of the total acreage to be added by the bill, 8,578 would be in West Virginia, 2,972 in Virginia, and 3,128 in Maryland. Unlike former versions of the national river bill, Gude's present proposal would probably eliminate any need for condemnation and in many cases even for outright purchase. Under provisions of the bill, after passage by Congress, the states and local communities have five years in which to use zoning, secure easements, or acquire lands to protect the shoreline before the federal government steps in. Only if a specific shoreline tract is threatened with development during this period would the federal government act to preserve the natural shores.

Hearings have not been scheduled but are expected by summer.

NEPA Amendment: HR 14468 has recently been introduced by Rep. John D. Dingell, one of the original authors of the National Environmental Policy Act and Chairman of the House Subcommittee on Fisheries and Wildlife Conservation and the Environment. This new bill, amended to NEPA, would establish and fund a nonprofit National Environmental Policy Institute, which, according to Rep. Dingell, would provide the tools to help us meet and handle such contemporary problems as economic growth, population growth, resource scarcities, environmental deterioration, and increasing social unrest, on something other than a casual day-to-day basis. With this bill, the sponsors hope to create an institution independent enough to be credible yet close enough to the decisionmaking process to be relevant. which can develop national long-term strategies for the future. The bill states that, as a federally chartered corporation, "such an institute should be a center for systematic environmental problem solving and policy-oriented research conducted on a broad interdisciplinary basis; such an institute should be available to local, state, and federal governmental agencies and the Congress to assist in the assessment, development, and presentation of policy alternatives, but should have the freedom and independence to extend its studies to matters other than those specified by its governmental sponsors " If established, the Institute will have an eleven-member Board of Directors, including the Director of the National Science Foundation. Chairman of the Council on Environmental Quality, Administrator of EPA, Chairman of the Board of the Inter-American Institute of Ecology, two members appointed by the President based on their interest in environmental problems, plus members (one each) who are professionally competent in the fields of environment, consumer affairs, labor, industry, and technology assessment.

Land and Water Conservation Fund: HR 13639 and S 3413 have recently been introduced to amend the Land and Water Conservation Fund Act of 1965 to increase the authorization of appropriations for the fund. The House bill, introduced by Rep. John Seiberling and more than thirty cosponsors,

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NATIONAL PARKS AND CONSERVATION ASSOCIATION 1701 Eighteenth St., N.W. Washington, D.C. 20009 would increase the fund ceiling from \$300 million to \$900 million. On the other hand, the Senate version (S 3413) introduced by Senator Metzenbaum and fourteen cosponsors would increase the fund level to \$500 million. Sponsors of the bills have expressed concern for action on the measures, which are needed to continue federal and state acquisition of land areas for recreation, including park inholdings, before land costs become prohibitive.

Strip mining bill: The House Interior and Insular Affairs Committee is nearing completion of mark-up of HR 11500, the strip mining regulation bill. A substitute bill, HR 12898, which was backed by the Administration and coal mining interests and contained weakening environmental provisions, was beaten back by a narrow 21 to 19 vote margin. Although HR 11500 has survived relatively intact, a total of fiftyeight amendments have been considered. Chief proponents of HR 11500, Rep. Patsy Mink (Hawaii) and Rep. Morris K. Udall (Ariz.), have been instrumental in lessening the impact of a hostile faction within the committee. On the positive side, the committee has voted to give western landowners the power to veto strip-mining in cases where the federal government owns the mineral rights to the land. Unfortunately, the land reclamation fund fee has been reduced from \$2.50/ton of mined coal to 30e/ton, causing fears by environmentalists that mined-out areas may not be reclaimed for decades. Reps. Mink and Udall fought unsuccessfully against amendments calling for transfer of major control of the fund from the federal government to the states. Environmentalists are hopeful that action will be taken by the House on this bill during this session of Congress.

Assateague Island: After several years of intense efforts, legislation finally has been introduced to amend the act establishing the Assateague Island National Seashore. S 3302 and HR 13975, although not identical bills,



both would eliminate sections 9 and 7 of the act, which require construction of a road along the entire length of the island (between the Maryland and Virginia bridges) and 600 acres of commercial development on the island. As Senator Mathias (R-Md) said on introduction of S 3302, "Most people have come to realize in the years since 1965 (when the seashore was established) that construction of a major roadway on such a fragile, shifting island would be an environmental disaster." The House bill, HR 13975, also would repeal the existing sections 7 and 9. while substituting new language requiring the Interior Department to undertake a comprehensive development plan for managing the national seashore and adjacent areas, and authorizing "a visitor transportation system to points within the seashore from areas adjacent thereto and from areas on the mainland."

One feature of the Senate bill that



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causes concern among environmentalists is the requirement that the Interior Department "receive, consider, hold public hearings, and act upon any claim filed by the County of Worcester, Md., ... for compensation for damage or other losses incurred arising out of or in connection with the repeal of section 7 of the Act. . . . " The act further requires that compensation be paid to Worcester County for any valid claim. Conservationists feel that this would set a dangerous precedent by providing compensation to local areas for the change in status or operation of existing federal lands.

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safety has been far too narrow; an unforeseen shift in weather patterns may doom millions of people to death in the next few years. The new grains disappoint us, demanding water and fertilizer which cannot be obtained; the deep wells fail for want of fuel for the pumps, now too expensive. Poverty and illiteracy are confirmed once again as the lot of men; the pollution of air, water, and soil poisons the world; the depletion of renewable and nonrenewable resources alike confirms the failure of the industrial purpose. And freedom and democracy sink in the general collapse.

GREAT SUMS of money, public and private, inadequate to be sure, but nonetheless generous, have been expended on efforts to cope with the population explosion worldwide. Great faith has been placed in finding better means of birth control and making them widely available. But now, belatedly, it is realized more and more that social and economic factors prevent people in too many cases from accepting assistance.

The truth is that millions of people everywhere still believe that large numbers of surviving children are necessary for their security in old age. They also believe, as a heritage of tragedy down the generations, that a large portion of their children will die before maturity. And they heed the admonitions of ancestors long departed and of the gods of their specific cultures who command them to procreate abundantly.

AYS MUST BE FOUND to teach men and women everywhere that large families are a burden on parents and children alike, and on the communities which must support them. They must realize that old-age security will depend on good public pension systems and on good jobs for a few children, not on too many unemployed offspring. An appeal must be made to their sense of responsibility for their own families and for the communities and nations to which they belong.

People must come to understand that when modern medicine brought the benevolence of reduced death rates, the old high birthrates had to be reduced in balance. This relief from early death has been a wondrous thing, and gratitude for it can be translated, if enough teachers undertake the work, into a will to match long life with reduced family size. **T**HE WORLD COMMUNITY should be mounting campaigns in every nation where overpopulation threatens prosperity to provide, within an expanded medical clinical system, the technical assistance needed for voluntary parenthood, and at the same time the moral education required to establish a small-family ethic.

A teachable ethic must be advanced: the morality of a maximum of two children to a family. Parents will be looking for guidance; to advocate an average of two is to offer a stone for bread. But a morality of no-more-than-two, or stop-attwo, is comprehensible and can be acceptable. It must be taught everywhere on a completely nondiscriminatory and egalitarian basis.

With such acceptance generally, the average will fall to about 1.6. It has fallen already in the United States to 1.9. A gradual decline of population levels will ensue, which will be welcome by that time because the overcrowding which the next century will produce will be intolerable. Within the relaxed conditions of a more spacious world, the size of the average family can be enlarged a little thereafter.

THE TEACHERS must be drammedics within which they must work. THE TEACHERS must be drawn from the They must be aided by doctors and paramedics in numbers never yet mobilized for any other social effort. The governments must support their work with adjustments in taxation and subsidies. Generous national and international financing must be provided. The United Nations Fund for Population Activities, for example, should be enlarged and utilized; the multiplicity of organizations concerned with fragments of the population problem in the various United Nations agencies should coordinate their efforts. The wealthy nations should lend financial help without stint, for humanitarian reasons first of all, and for the practical reason, if need be, that disaster in the underdeveloped world will spread without mercy, by one channel and another, into the homes of the privileged.

THE DELEGATIONS which will meet in Bucharest have a weighty responsibility. The time is short; the omens are unfavorable; but the courage and intelligence which are necessary for the great task ahead must nonetheless be mobilized, and the will to survive, to live, must somehow prevail among the nations of the earth. —Anthony Wayne Smith



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