NATIONAL PARKS & Conservation Magazine

The Environmental Journal

July 1971

DARKNESS

ON ANY STARRY NIGHT, throughout these luxurious summer months, in the mid-latitudes of the north, you may stroll outdoors, if you live in the country, perhaps on a grassy knoll overlooking a gentle stream valley, and turn your eyes southward toward the longest view from Earth.

There you will see, etched in stars, the constellation of Sagittarius, the Archer, the fabled Centaur, with lifted bow. The red eye of the other Mars, Antares, will return your gaze from the Scorpion. And as a pale, white fire, quiet, cold, immensely distant, beyond all the immediate stars, you may look upon the flaming heart and whirling vortex of the Milky Way Galaxy.

The great wheel turns once in about 200 million years. We see it as a belt of whiteness encircling the entire sky on a moonless night. Our sun is but one of perhaps 200 billion stars that make it up. We live toward its outer edge, which lies to the north; the great concentration of stars lies south.

Now we look down the long perspective toward the veritable Heart of Fire; the light has traveled 30,000 years or more to reach us; ancient light, older perhaps than the present races of men. It has crossed nearly two sextillion miles of outer space, an infinity, incomprehensible. Only the Andromeda Galaxy, visible in the northern hemisphere, and the Magellanic Clouds, in the south, are more distant, and they are but a faint glow to the unaided eye.

In quietude before this majesty, we renew our sense of oneness with the universe; we set ourselves firmly within the context of our little time, and our mortal flesh, and yet within a sense of the continuing power and promise of life.

Wiser cultures than our own, nomads, shepherds, wandering the open hills, may have understood these things better than we; modern man, however, may be at a turning, from which he may recapture this knowledge.

From the dreams of night and sleep arise the symbolic visions which, rightly understood, yield personal insight, prescience. From the dark background of the mind, not the gleaming edge of daylight awareness, come the depth, balance, reassurance, which distinguish wisdom from ingenuity.

Night-time and darkness yield values in themselves; in olden times, to be sure, they were so taken for granted that they were hardly missed as they vanished. But modern man, who has shattered silence, has shattered darkness as well.

Between urban-industrial man and the long view of the Heart of Fire a pallid miasma rises. Like the pollution of the seas, the process has been gradual, spanning half a century. The glare of the cities is dimming the light of the stars.

The domes of the great observatories are like temples. They model the arch of the heavens. Within them, when the apertures are open, the night air stirs freely and coolly. Voices, as in a whispering gallery, carry easily. The work of watching or photographing the stars and the galaxies brings with it a sense of eternity. The great optical telescopes move easily, silently; men work without haste.

High above Los Angeles is Mount Wilson Observatory, with its 100-inch telescope; southward toward San Diego, on mountain ramparts toward the Pacific, stands Palomar, with its 200-inch reflector, largest in the world, engaged in the photographic charting of the trans-galactic universe, a work for many remaining decades, every moment scheduled. But the glare of the cities is destroying visibility at Mount Wilson and Palomar.

Man-made light rises up to shut out the stars; light from the streets, reflected from concrete; light from buildings, burning all night; light from the garish advertisements, from the endless hawking of goods, day and night. And the light, and the noise, and the vapors also destroy the peace and the sleep of the people in the cities.

Now light clashes with enlightenment; and yet not light, but the abuse of light. If we may speak usefully of noise-pollution, so also of glare-pollution. Light and darkness, rightly in balance, are values for men. The counter-value against light, the negative value, is glare.

The famous 123-year-old observatory at Georgetown University in the city of Washington is closing its shutters, locking its doors. Perhaps it will survive as an historical monument. The Rev. Francis J. Heyden searched the skies there throughout 25 years of patient observation, and in the same period taught a long succession of young astronomers.

Astronomers were always dedicated men; the monetary emoluments of their profession were

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COVER *Brook and Mossy Stones by Eliot Porter*

This icy stream tumbling over rocks lush with moss in Great Smoky Mountains National Park is typical of mountain streams throughout the verdant southern highlands.

BACK COVER *Strip Mining Aftermath by Billy Davis*

Acid mine drainage, the foul blood of stripped land, lies in deadly ponds and trickles near Earlington, Kentucky. The poisonous liquids make deserts of streams and rivers and can make a mockery of any efforts to "reclaim" the ruined earth.

National Parks & Conservation Association, established in 1919 by Stephen Mather, the first Director of the National Park Service, is an independent, private, nonprofit, public-service organization, educational and scientific in character. Its responsibilities relate primarily to protecting the national parks and monuments of America, in which it endeavors to cooperate with the National Park Service while functioning as a constructive critic, and to protecting and restoring the whole environment. Life memberships are $500. Annual membership dues, including subscription to National Parks & Conservation Magazine, are: $100 sustaining, $50 supporting, $15 contributing, and $10 associate. Student memberships are $8. Single copies are $1. Contributions and bequests are needed to carry on our work. Dues in excess of $10 and contributions are deductible from federal taxable income, and gifts and bequests are deductible for federal gift and estate tax purposes. Mail membership dues, correspondence concerning subscriptions or changes of address, and postmaster notices or undeliverable copies to Association headquarters in Washington. When changing address, please allow six weeks' advance notice and include old address (send address label from latest issue) along with new address. Advertising rates and circulation data are available on request from the Advertising Manager in Washington.

THE SOUTHERN HIGHLANDS: A SHORT HISTORY

The ancestors of the southern highlanders came to those hills in the eighteenth century from the cities and plantations of the New World. Most of them were of peasant and yeoman stock, illiterate and unskilled. Their homelands were England, Scotland, and Ireland. Anarchists by temperament, they left the populated parts of the colonies to homestead on uncrowded lands and remain independent of organized society. By the turn of the nineteenth century they were settled, scattered in self-sufficient family units, along creeks and hollows of the southern plateau.

The mountaineers lived a frontier life-style. They built log cabins, wore homespun clothes, and ate home-grown food. Their history is one of a sturdy folk whose spirit was broken by outsiders who robbed their land of its natural wealth and left the people nothing substantial in return.

The first raid on the mountaineers' natural resources came in the first quarter of the nineteenth century. The target was the tall, straight virgin timber, which the hill people cut down and carried to market in exchange for money. Some people accumulated small savings as a result, but these were wiped out during the Civil War. Timber speculators from cities arrived in the final third of the nineteenth century. They purchased the trees in exchange for a few pennies—the going price was less than $1 per tree. Some of the trees were harvested then, and more went after 1940.

During the 1890s the first coal men came. The southern hills were laced with rich seams of bituminous coal, a fuel that came more into demand as the industrialization of the nation progressed. Buyers from urban areas bought up state-owned lands, many of which were lived on by mountaineers who had not bothered to claim legal title. In addition, coal companies purchased title to the minerals underlying the land that the mountaineers did own, along with the right to extract them. By 1910, according to Harry Caudill, nonresidents held title to the major portion of the land in Kentucky, heart of the southern plateau. Approximately three-quarters of the timber and 85 percent of the minerals on remaining lands were owned by nonresidents.

Construction of railroads on the hills signaled the coming of the coal mines. The first big coal boom lasted from 1912 to 1927. Mountaineers who left their cabins for the mines moved into new houses built by mining companies, rickety by city standards but plush by those of the hill people. The omnipresent company stores sold food, clothing, and consumer items to the miners and their families in exchange for most of the miners' paychecks. Even those mountaineers who did not go into the mines nevertheless felt the effects of the new economy. Many of them sold produce to the mining camps.

In 1927 the boom ended. The farmers fell victim to a disastrous flash flood in spring of that year that washed away freshly planted crops and inches of topsoil, as well as houses, highways, and bridges. The same spring marked the beginning of a long slump in the coal business. The Great Depression hit the southern Appalachians as hard as any area in the nation. Most of the meager accumulations of wealth disappeared when the banks folded, and chances of earning any more were ruined when the mines shut down, as most of them did. Three-quarters of the people, some of them crippled or chronically ill from years spent in the mines, accepted relief from the federal government.

Some 10 years after the Depression began, the economy of the highlands reawoke, stimulated by the beginnings of the Second World War. The old coal mines started up again, and some operators began using trucks to transport coal to the railroad. Many of the truck mines—small operations requiring minimal capital outlay—were owned by the mountaineers themselves. However, the new boom was short-lived. After the end of the war, rising costs forced many of the truck miners out of business. Improved equipment in the larger mines meant that fewer miners were needed. Strip mining, a technique that came into common use in the 1950s, required even fewer workers. For the first time in their history, the mountaineers faced mass unemployment in the midst of an economic boom. The younger and more intelligent people fled to the cities, and between 1950 and 1960 the population of the southern plateau diminished by 25 percent.

Those folk who remain, in spite of some efforts by the federal government to improve their lot, are resigned to living in poverty. Little of the wealth generated by coal mines ever had been channeled into public services, and schools, roads, and health care always have been inadequate. Most of the houses are grey and decaying. The virgin timber is practically gone. Huge shovels tear at what is left of the hills. Most of the mountaineers simply have given up hope. ■

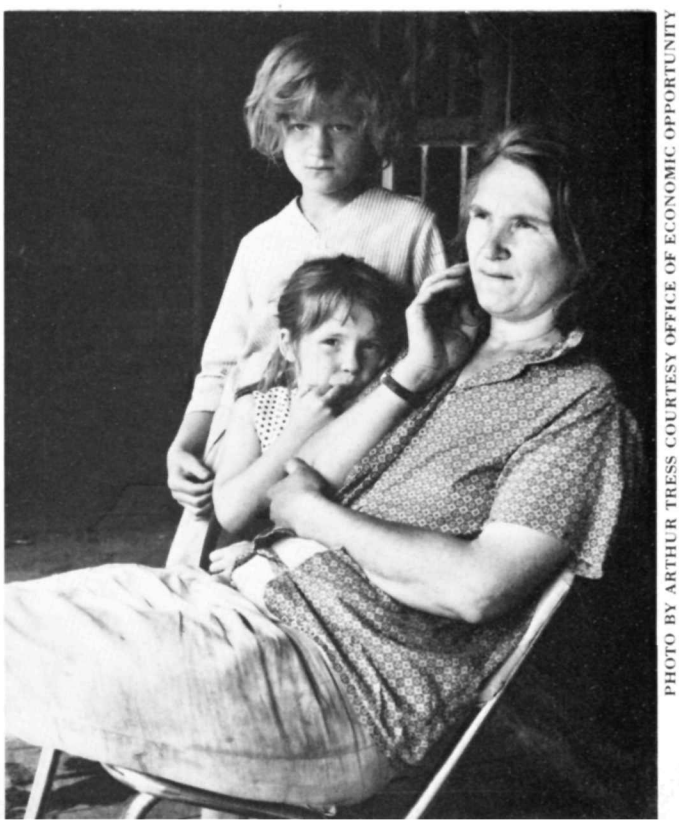

PHOTO BY ARTHUR TRESS COURTESY OFFICE OF ECONOMIC OPPORTUNITY

PHOTO BY PAUL CONKLIN COURTESY OFFICE OF ECONOMIC OPPORTUNITY

J. E. THOMPSON

THREATS TO SOUTHERN APPALACHIA

Michael Frome

It was in 1901 when the Secretary of Agriculture, James Wilson, transmitted to President Theodore Roosevelt the monumental report on southern Appalachia that had been conceived by the Chief Forester, Gifford Pinchot. Never has there been anything like it, before or since that time, that so comprehensively studied the resources of this highlands region and the steps required to assure their lasting protection and productivity.

Appalachia was already then a cultural and social unit, the "Back of Beyond." Horace Kephart, the writer, who arrived in the mountains early in the century, called it the "housetop of Eastern America." He found it a frontier of time, where old legends were daily realities for the pioneer farmers, herdsmen and hunters, trappers and traders, preachers, outlaws, and Indians. It was almost as though he had been carried back, asleep, and had awakened in the eighteenth century to meet Daniel Boone and his kith in flesh and blood.

That 1901 report, however, viewed the Appalachian scene from southwestern Virginia to Alabama with a broader perspective. The region had been sparsely settled and little visited, it revealed, until it was discovered near the end of the last century by lumbermen and miners. At once they joined the hillside farmers in stripping the mountains of their treasures. Forests that had taken centuries to grow were decimated in less than a decade. From any one of thousands of cleared fields more soil sometimes was removed during a single heavy rain than during the preceding 10 centuries of natural forestation.

Where the forest was not invaded, it was a wonder to behold. Flowers and shrubs grew everywhere, in the densest woods, and in open clearings and on the treeless, tangled heath balds of the higher mountaintops. The incredible variety of life-forms still is the most spectacular feature of the southern Appalachian land. Here the Fraser magnolia, or "cucumber tree," of the South thrives on the same mountainside with the red spruce of the Canadian forests. The peaks are green, and their slopes are contoured, in contrast to the stony outcrops of New England and the Rockies. Appalachia had escaped the Pleistocene glacial sheets that flowed down over the continent, becoming instead a haven for northern life-forms that had been driven south in search of survival.

"It may be added," wrote Secretary Wilson about southern Appalachia, "that it contains the highest and largest mountain masses, and perhaps the wildest and most picturesque scenery, east of the Mississippi River; that it is a region of perfect healthfulness, already largely used as a health resort both summer and winter, and that it lies within a little more than a day's travel of the larger portion of the population of this country."

On this basis, he (and Pinchot) proposed establishment of a vast Appalachian national park or forest reserve, with provision for careful and conservative logging of valuable timber trees such as walnut, cherry, tulip poplar, white oak, white pine, and basswood, and assuring protection of the forest cover for the benefit of valleys below and cities far beyond. The idea was endorsed heartily by the President; by the legislatures of five Southern mountain states; and by a host of scientific, patriotic, business, and civic organizations, including the Appalachian National Park Association, which had been founded specifically to advance the cause of the region.

As a result of such rising public pressure, Congress in 1911 enacted the Weeks Law to establish national forests in the East. The first purchase of land was made in North Carolina, the heart of the highlands, for the new Pisgah National Forest. The full scope of the program, however, never was realized.

The principles set forth in the 1901 report are as valid today as when it was published 70 years ago—and as urgently needed. Appalachia is in trouble. In places where forest cover should be carefully protected, the mountains are being exploited through construction of resorts, second-home subdivisions, condominiums, golf courses, and chair lifts, projects that benefit only a few and shut off access to the many. The Appalachian regional aid program, ostensibly designed to serve the undernourished and overlooked humble of the region, has provided a stimulus to highway and dam builders and industrial polluters, while creating few jobs or other benefits for those who need them most.

It is difficult to assess which federal resource agency is most derelict in its duties or is effecting the most damage to Appalachia. The Forest Service, for example, which received the mantle of responsibility under the Weeks Law, persists in promoting timber production above other uses, certainly with disdain for botanical and biological values.

"The vegetation of this area, as part of the Southern Appalachian Highlands, represents the greatest richness of any forest flora on this planet," Dr. Robert B. Platt, Chairman of the Biology Department at Emory University, declared recently. His statement was made in opposition to tree-cutting on moderate to very steep slopes of the Nantahala National Forest, adjacent to a primitive Girl Scout camp called the Standing Indian Natural Area. "Current usage of much of the irreplaceable resources of the national forest is being evaluated primarily in terms of the needs of those who control society today, whereas the needs of the oncoming generations are not yet known. A vastly increased need for recreational areas of all kinds, including wilderness and semi-wilderness areas, can be predicted with as much substance as the needs of the oncoming generation for lumber."

The Forest Service lately has conducted a series of "Listening sessions" as part of what it calls "a bold new program aimed at getting better coordination and balance in land use and planning on national forests in the Southern Appalachian Mountains." Certainly confession is good for the soul, even of an old-line bureaucracy set in its ways. Although the signs may be hopeful, one must wonder about the ultimate objective when the "listening" is accompanied by a stream of color brochures and other promotions describing the abundant blessings of clearcutting, a thoroughly "efficient and economic" system of placing timber production above all other considerations. As recently as March 6, 1971, before a Tennessee wildlife symposium, a Forest Service wildlife biologist, Jerry McIlwain, extolled the ability of clearcutting to provide food for game. He did not, however, discuss such aspects as the disruption of ecosystems; the use of 2,4,5-T to poison native hardwoods, which are the source of game food; the extensive size of clearcuts, leaving bare ground and dead stumps over large areas; or the effect on aquatic life of streams.

"There is little indication of a genuine desire to bring the people into the decision-making process," declares Dr. Charles S. Prigmore, president of the Alabama Conservancy, which is leading the fight to establish an 11,000-acre wilderness in Bankhead National Forest, despite resistance from the federal agency. "The Forest Service indeed holds hearings at infrequent intervals, particularly when public pressure becomes irresistible. But this is an attitude of patient tolerance of public concern and thinking, rather than any real encouragement of joint decision-making. Forest Service personnel consider themselves to be the experts and the public to be ignorant at best and obstructionist at worst."

The case of the projected road across the Unicoi Mountains between Tellico, Tennessee, and Robbinsville, North Carolina, constitutes an especially sorry chapter. For here the leadership of the Forest Service decided for its own convenience—

and without considering the public—to sacrifice the Joyce Kilmer Memorial Forest, which lies astride the route.

When this marvelous primeval tract of 3,800 acres in Nantahala National Forest was established in 1934 as a memorial to the author of "Trees," the agency pledged to protect it forever as "a place of inspiration and a treasure of native flora and fauna." So it has been loved and enjoyed by countless thousands. But in 1964 Edward P. Cliff, Chief of the Forest Service, approved the construction of a road on steep terrain in the upper portion of Joyce Kilmer. He told his boss, Secretary of Agriculture Orville L. Freeman, that the highway would improve access. But he failed to mention the inevitable scars in the wilderness from cuts and fills, disruption of the ecosystem due to siltation, or that heavy tourist travel would create pressure on a fragile area protected primarily by lack of access. The Chief carefully avoided open hearings. When finally they were conducted, in June 1970, the Forest Service and Bureau of Public Roads chose Robbinsville, off the beaten path, and gave scant public notice.

The public, nevertheless, has protested with vigor. Last October a group went out to observe destruction already wrought by surveying crews. They carried signs bearing such messages as: "Joyce Kilmer, Shot in 1918—Raped in 1970" and "Roads are made by fools like thee, only God can make a tree." Local residents have been told the road would bring in tourist dollars. But the boomers did not say it would disrupt the quality of outdoors life the people now enjoy, or that it would drive away hunters, fishermen, campers, hikers, and nature lovers. "You can't make a scenic highway for people who want to see a virgin forest," Newt Smith, professor at Western Carolina University, declared before an ecology protest seminar.

The Forest Service now speaks of moving the highway across a ridgetop into the Slickrock drainage. But this concession is not enough, particularly when citizen groups are proposing the establishment of a Slickrock-Joyce Kilmer wilderness area. There is no way to minimize damage or restore ecological balance when a modern highway invades a highland wilderness; the road destroys. The most desirable, and least expensive, alternative is to cease construction altogether, utilizing the two ends of the road as gateways to the wilderness and memorials to common sense regained.

Another wanton and wasteful construction project that needs to be canceled forthwith is the Tellico dam project on the Little Tennessee River in East Tennessee. This boondoggle is promoted by the Tennessee Valley Authority as a "multipurpose river development," but it is not justified by navigation or flood control needs, or by demand for manufacturing locations, inasmuch as many industrial sites on nearby reservoirs are going begging for users.

In this valley a dam would wipe out nearly 15,000 acres of fertile bottomland. It also would drown the remains of the ancestral capital of the Cherokee Indians, called Echota, or "Chote the metropolis," and nearby Tuskegee, birthplace of Sequoyah, the Indian scholar, which may be among the most important archaeological sites in eastern America. Another major historic site along the "Little T," Fort Loudoun, the first English fort west of the Appalachians, was reconstructed with loving care over a period of many years by patriotic Tennesseans. Though it would not be totally destroyed, the fort would become accessible only by boat, making a mockery of its historical context.

TVA, unresponsive to the people and exemplifying bureaucracy unleashed, has tried to dismiss its opponents as "a handful of selfish trout fishermen trying to deprive the region of progress." But in fact the Association to Save the Little Tennessee has had the widest support from patriotic, farm, and conservation organizations. It is now fighting through legal means to save the last stretch of the river that remains undammed—a clear, cold stream that provides superb canoeing and miles of the finest trout fishing in America. With its

STANRICH STUDIO

Aftermath of clearcutting, Cherokee National Forest

unique qualities it could easily be designated a national or state scenic river and provide an economic resource in its own right. The river could become the core of a real regional plan encompassing the adjacent Great Smoky Mountains National Park, national forests, and TVA reservoirs. Only $4 million involved in construction of the Tellico dam thus far would be lost. The cost of development of a national or state scenic river would be fractional and the return far greater.

TVA's masquerade as an experiment in regional planning is over. TVA has deteriorated into an environmental disaster, a booster of unneeded and unwanted construction for its own self-indulgence and self-perpetuation. In western North Carolina it lately has spawned a nightmarish "water resources development" plan for the Upper French Broad River basin, calling for the eviction of hundreds of rural families and the flooding of more than 10,000 acres, including fine farmland. The Upper French Broad Defense Association is mobilizing political, scientific, and legal support to save the area.

One should not fail to record TVA's contribution to the devastation of Appalachia through strip mining. This agency is the largest purchaser of coal in the world. Its purchasing policies drive the price of coal to a level where it can be mined economically only by stripping. As a result, many countrysides, particularly in Kentucky and West Virginia, have been rendered desolate. Mountain families have been driven to seek refuge in urban ghettos. Lakes, streams, and rivers have been fouled with acid, silt, and sediment. For years TVA operated without land reclamation requirements in its coal contracts; but even now, though such stipulation appears in the standard contract, there is little reclamation or enforcement. Little wonder that the Environmental Defense Fund and other groups have brought suit against TVA for contracting for coal without filing environmental impact statements as required by the National Environmental Policy Act.

Citizens have the right to expect the quintessence of environmental responsibility from the National Park Service, above all other agencies. But in directing the affairs of the Great Smoky Mountains National Park, chosen years ago by Congress and the people for preservation as the wilderness jewel of southern Appalachia, this has simply not been the case.

In 1966 the National Park Service presented a wilderness plan that was, in fact, a design to carve up and fragment the Smokies with modern highways. Only the intensity of public opposition stayed its hand. Now the agency has issued a new report conceding at last that the Smokies comprise "a natural treasure of plant and animal life living in an ecological balance that once destroyed can never be restored." This document seems to recognize the worst enemy of the parks as the automobile, proposing restrictions on traffic and gradual phasing out of Route 441, a main highway bisecting the park. In addition, the proposal of another wilderness-disrupting highway, which highlighted the plan of 1966, is withdrawn in favor of a scenic loop road around the perimeter of the park, as urged by citizen organizations.

But this is not enough. Along the loop road the Park Service intends to locate no fewer than 12 visitor "clusters," complete with campgrounds and a special breed of highway masqueraded under the label "motor nature trail." Disregarding environmental impact and its mandate by law to preserve the wilderness for the benefit of future generations, the Park Service persists in clinging to a 1943 agreement with Swain County, North Carolina, guaranteeing road access between Bryson City and Fontana, to rationalize overdevelopment. Actually, it is the same old appeal for numbers, or, at best, pragmatic solving of today's problems at the sacrifice of tomorrow's civilization.

"It must be clear that the demand which now looms over us can never be satisfied," once wrote Harvey Broome, the late apostle of the Great Smoky Mountains Hiking Club and president of the Wilderness Society. "Slow attrition follows development. Almost without exception, wherever there is a road or dug trail or shelter facility in the virgin forest, there is slowly spreading damage. The areas contiguous to developments become littered, eroded or threadbare from heavy use and abuse.

"No further development of any character should take place. No more trails; no more shelters; no more roads; no expansions, extensions, or additions to existing facilities. To protect what is left we must learn to live with facilities we now have. The hardest thing will be the decision itself."

Federal administrators obviously lack the commitment or courage to make the hard decision. In all the great natural domain of southern Appalachia, only two areas of North Carolina national forests, Linville Gorge and Shining Rock, totaling but 20,000 acres, are protected in the National Wilderness Preservation System. Yet the desire of the people is abundantly plain. Speaking for fellow Alabamians supporting the proposed Sipsey Wilderness, a remnant of the original forest in the gorges of the Sipsey River, Governor George C. Wallace declared, "I am vitally interested in saving some segment of our wild areas for the enjoyment of future generations."

Unselfish people are advancing the same idea throughout Appalachia. An Asheville businessman, John M. Reynolds, proposed in 1969 establishment of a great new wild park composed of federal, state, and private lands north of Asheville, encompassing Mount Mitchell, the Craggies, and Black Brothers range, some of the most picturesque property in the East. "The time is coming fast," he warned, "when there will be no more wild land to acquire."

"We owe it to the human heritage to rebuild 'old growth' or climax forest ecologies in substantial quantity in all elevations of the country," declared George Hermach, of Marion, Virginia, at one of the public hearings conducted by the Forest Service. His idea is to insure the opportunity of generations unborn to walk again in the Appalachian hardwood forests among trees of 5-foot diameter.

Certainly these matchless mountains and their sparkling streams deserve the same love and care that men for centuries have bestowed upon their finest works of art. The 1901 plan still can provide a valid guide. It should be updated with a comprehensive inventory of the Appalachian environment, its flora and fauna, and the needs of its native people. This mission can be accomplished by those who have abiding faith in themselves, in each other, and in the future of the southern highlands. ■

A well-known environmental activist, Michael Frome is conservation editor of *Field and Stream*. He is author of *Strangers in High Places*, the story of the Great Smoky Mountains, and has begun working on a book about the southern mountains for a new *Time-Life* series on American wilderness.

STRIP MINING

Jack Trawick

THE SIGN ALONG THE ROADSIDE says "Keep Kentucky Green."

But for as far as you can see, there is very little to keep green.

It is a study in black and gray and yellowish-brown, etched in scars on what were once beautifully forested slopes.

There are broken and battered trees, mangled by huge rocks and piles of shale that have been pushed down the mountainsides to clear the path to the coal and minerals that have been taken from the mountains. There is garbage, and there are the rusting hulks of junked automobiles strewn down the slopes.

You don't have to search for the damage, the depression, the oppressive atmosphere. It is all around you, above and below, and plainly visible from the main highways, such as they are.

And even as you look, huge trucks, some loaded with as much as 25 tons of coal, rumble by in a steady stream, kicking up dust and further damaging roads that, in some places, have already been damaged so badly that the blacktop surface has been mashed into the dirt out of sight.

This is Letcher County, Kentucky. This is strip mining in the Appalachian mountains. The scene is no different throughout most of eastern Kentucky, most of West Virginia, and huge sections of Pennsylvania, Indiana, Ohio.

Strip mining, in varying degrees, has affected all 50 states. The effects are more apparent, and the damage more enduring, in mountainous regions, because of the difficulty and expense in reclaiming the land after the mining is finished.

Strip mining goes by many names. The mining firms do not like the term "strip mining" because it has come to carry an unpleasant connotation. "Surface mining" is more acceptable to them. It has been generally defined to cover all types of mining on the surface of the earth, as opposed to deep mining, which is underground. Other terms used include:

- "Open cut" or "open pit" mining. This generally involves simply digging a hole in the ground and taking out the minerals being sought.
- "Auger mining." Huge drills are used to bore into the earth or mountain to get to the minerals.
- "Cut and fill mining." This involves extracting huge cubes from the earth, separating the minerals from the soil, and replacing the unused soil back in the hole from which it came.

The terms and methods vary, largely depending on the type of terrain being mined. But to conservationists they all carry essentially the same meaning: tearing up the earth.

In the coal fields of eastern Kentucky, the strip mining most widely used has been this:

Wide bands are stripped from the side of a mountain, moving around the circumference of the mountain, to get to the seams of coal. The coal is removed, leaving a shelf around the mountain. Work proceeds down through the hill by digging along the contour of the slope. The work may be done at several levels on the same hill.

A new method is being tested now in eastern Kentucky. It involves shearing off the top of a mountain and pushing it into the neighboring valley, exposing the mineral. The mineral is extracted, another level is sheared off and pushed into a valley, and more mineral is extracted, and so on. The end result would be to eliminate the mountains and provide level land.

Conservationists increasingly are becoming concerned about the scars left by strip mining—not only because of the effect they have on the appearance of the land, but also because of the effect on the people who must live with the scars, the damage to streams and whole watersheds, the damage to forests, the damage to wildlife, and the elimination of other potential uses of the land, such as for recreational purposes.

A survey by the U.S. Department of the Interior, completed in the summer of 1967, showed that 3.2 million acres across the United States had been surface mined. But more significantly, the survey showed that 2 million acres still needed some degree of reclamation to prevent a broad range of environmental damage. And the mining is continuing, with an estimated 20,000 mining operations across the country affecting an additional 150,000 acres a year.

As you drive from northwestern North Carolina through southwestern Virginia to the mining region of eastern Kentucky you pass through beautiful mountain countryside, as yet

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Jack Trawick is state news editor for the *Winston-Salem Journal and Sentinel* in Winston-Salem, North Carolina. He wrote and photographed a series of articles about strip mining for his newspaper, which, with other environmentally oriented reporting, won for the paper the 1970 Pulitzer Prize for public service.

PHOTO COURTESY COURIER-JOURNAL AND LOUISVILLE TIMES

Strip mining on Pine Mountain, Letcher County, Kentucky. JACK TRAWICK

largely undisturbed. There are clear rivers, beautiful mountain streams, lovely hills and pastures and mountains and meadows. The contrast when you reach the mining country is startling.

The streams there are loaded with silt or have their banks lined with "spoil banks," the rubble and rock left from surface mining. Their waters run yellow or red, tainted with sulphur and acids and minerals that seep from the scars torn in the sides of the mountains.

The forests are battered and mangled. The mountains, now, have somehow lost their majesty and look beaten and scarred and ugly.

And there are the people. The men driving the trucks who eye you suspiciously, particularly when they see your camera. The children who smile wanly and wave. The women who somehow look beaten down. The men who come back from the mining operations late in the day with their faces covered with black dust. The youth who roam aimlessly through the valleys in the afternoons after school is out.

Realizing that these are the descendants of a once proud, fiercely independent people who crossed the rugged mountains from North Carolina and Virginia and elsewhere to settle eastern Kentucky in the 1700s, you can't help wondering what has happened to wear them down and make them a dependent people.

The sociologists have their theories, the politicians their promises, and the oil and steel corporations their coal and minerals. But the people have the scars and the land that is rapidly losing its usefulness. The problem is theirs.

It is increasingly becoming apparent that reclaiming mountain land that has been strip mined is virtually impossible.

In flat areas, where the topsoil and subsequent layers of soil can be stripped back one by one until the minerals being sought are reached, the minerals can be extracted and the soil replaced in its proper sequence and in a few years' time the damage is almost unnoticeable.

But in the mountains once deep cuts are made in the steep slopes, they are there to stay. It is difficult to get trees and grass to grow, and even when they do they don't fully hide the scars. And the seeping chemicals destroy the ability of the land to support vegetation.

The streams fill with silt (some studies in Kentucky have shown that the sediment yield in watersheds that have been strip mined is as much as 1,000 times as great as in undisturbed areas), and the chemicals that work their way into the streams destroy their ability to support life.

Perhaps the most startling statistic concerning strip mining is that most of what has been done in the United States has been done in the past 20 years. For 10 years it went almost

unchecked. Then in the 1960s some states began to regulate strip mining. But only in the past two or three years, as an increasing national awareness of environmental problems has developed, has there been serious concern about the effects of strip mining and serious efforts to curb both the mining and the effects.

Somewhere, in some state, a new threat is almost constantly arising. Strip mining is more economical than deep mining, and the dangers to miners are lessened. And the new federal mine safety regulations, with stringent new requirements concerning safety in deep mining operations, seems to be having the side effect of pushing more mining firms into surface mining operations.

But it has been demonstrated that concerted public reaction can halt the threat, if it comes soon enough and is persistent enough.

One case in point is what happened in a six-county area along the North Carolina-Virginia border in late 1969 and early 1970.

The Gibbsite Corporation of America, a subsidiary of Colonial Oil and Gas Corporation of Rochester, N.Y., late in 1969 began acquiring mineral rights leases in the area and in December announced plans for a mining operation to extract gibbsite, a low-grade mineral which can be used in aluminum production.

Some of the lands on which the company acquired mineral rights border the Blue Ridge Parkway, a scenic highway that stretches from the Shenandoah National Park in northern Virginia to the Great Smoky Mountains National Park at Asheville, N.C. Other land involved abuts North Carolina's Stone Mountain State Park, a new park being developed around a huge solid granite formation. The entire area is largely undisturbed scenic mountain land, an area that is undergoing development as an outdoor recreational and resort area.

When a newspaper made public what the firm was doing and what its intentions were, there was an immediate public outcry. Daily and weekly newspapers took up the battle cry; and local governments, civic groups, development associations, and even state legislators joined in.

The Gibbsite Corporation let its leases lapse and abandoned its plans.

There are many cases, however, in which the outcome has been different, and the struggle more frustrating.

In some counties in eastern Kentucky, local governments have become concerned and local citizens aroused. In Pike County, Kentucky, there have been demonstrations against strip mining, with people lying down in the paths of mining equipment to try to halt the operations.

But the strip miners had a big head start in Kentucky, and the opponents have had little success.

Harry Caudill, a lawyer and author who lives in Whitesburg in Letcher County, has become a recognized spokesman for conservationists in the Appalachian region. He is a native of Letcher County and has lived all his life with the mining problems in eastern Kentucky. His book, *Night Comes to the Cumberlands*, in the early 1960s became a textbook on the problems of Appalachia.

Caudill frequently talks in terms of rape when he discusses strip mining. And rape it may well be in eastern Kentucky, for, under mineral rights leases acquired 50 to 100 years ago by major corporations outside the state, much of the land has been strip mined without the consent of the property owners.

Caudill's concern is not only for the immediate effects of strip mining. He feels strongly that the answer to the nation's growing water shortage problem may lie in the Appalachian region, where rainfall is heavy and water is stored. Damage to the watersheds could eliminate a valuable national supply of water.

He also feels that the damage being done to the forests is eliminating valuable hardwood stands (and even where reclamation is successful, most of the plantings are in pines, not hardwoods), and perhaps more significantly, is eliminating

JACK TRAWICK

Yellow Creek in Knott County, Kentucky, is full of silt and strewn with rubble and trash. Its color comes from sulphur exposed by strip mining shovels.

PHOTO COURTESY NATIONAL COAL ASSOCIATION

The largest mobile land machine in the world digs for coal near Zanesville, Ohio, while two men watch. "Big Muskie" is 10 stories tall, as wide as an eight-lane highway, and has a bucket that can hold 325 tons of earth and rock. Ohio Power Company built the giant machine to provide coal for an electric power plant.

an effective means of control for the growing smog and air pollution problems in urban centers. The trees produce oxygen, helping to purify polluted air.

Caudill is a former Kentucky legislator and had a major hand in the state's strip mining laws, which he says are woefully inadequate. Caudill has suggested the following answers to the strip mining threat:

- Forbidding strip mining in areas where the slopes are so steep and the rainfall so great that reclamation would be impractical or impossible, and in areas of particular scenic beauty, areas important to wildlife, and heavily populated areas where "important human values would be disrupted."
- Allowing strip mining for minerals only in areas where total reclamation can be carried out "promptly and effectively."
- Requiring, in areas strip mined, that the topsoil be scraped off and set aside, then the subsoil and rock strata lifted out, and all replaced in their natural order and compacted when the mining is completed; further, that the land be treated with fertilizer and limestone and planted with trees. (He says this has been done effectively, and with economic feasibility, in Germany, England, and Czechoslovakia.)
- Federal purchase and reclamation of lands already stripped and not restored.

At the state level, Caudill feels that a "severance tax"—a tax on the minerals extracted—is needed. He recommends that this money—perhaps several cents a ton, or a percentage of the profits per ton—should be used partly for land reclamation and partly to provide schools, libraries, and hospitals and to repair roads in areas mined.

In the meantime, strip mining continues to spread. The Department of the Interior estimates that more than 5 million acres across the country will be affected by 1980. Conservationists are convinced that time is running out—that so much has been done in the past 20 years that irreparable damage to natural resources is a certainty unless better reclamation efforts are made now and industries stop strip mining in areas where reclamation is impossible. ■

TVA RAVAGES THE LAND

Ken Hechler

WHEN FRANKLIN DELANO ROOSEVELT launched the Tennessee Valley Authority, his April 10, 1933, message to Congress rang with phrases about conservation of our land resources. One of my boyhood idols, a sad-eyed senator from Nebraska named George W. Norris, also dreamed of a Tennessee Valley Authority that would produce public power and provide unified planning for an entire river basin, so that the soil, forests, hillsides, and streams would be protected for future generations.

The dreams of Roosevelt and Norris are being shattered as the hills of Kentucky and Tennessee are gouged by strip miners to satisfy the insatiable thirst of the Tennessee Valley Authority's steam plants for coal. In particular, the Cumberland Mountains of eastern Kentucky are being devastated by the escalating demands of TVA for strip-mined coal. TVA, the nation's biggest producer of electricity, is turning its back on one of its original objectives—to preserve the land—in order to generate vast quantities of power.

More than 80 percent of TVA's power is supplied by 11 coal-burning steam plants. Last year, TVA bought 32 million tons of coal, which is about 10 percent of the coal burned by the entire electrical industry. Approximately half the TVA coal was strip mined.

Of all the destructive and polluting activities that modern man has unleashed upon the earth that sustains him, one of the most devastating has been the one least noticed by the American public. Strip mining for coal used to be carried on in isolated areas, but now the rapidly increasing demand for production has thrust this rape of the environment into people's backyards and revealed the ugly scars along frequently traveled highways. It is ironic that of all the giant industrial interests that are implicated in strip mining, none is more deeply involved than Uncle Sam himself.

Deep or underground mining entails removing the coal from the earth; strip mining removes the earth from the coal. In eastern Kentucky, one of the largest TVA contracts provides for the purchase of 50,000 tons of coal per week from Kentucky Oak Mining Company from July 1, 1970, through June 30, 1975, at a cost of $78 million. Other smaller contracts have been concluded by TVA to purchase strip-mined coal in eastern Tennessee.

In the case of the eastern Kentucky stripping, the earth is cut away from a lateral "contour" around the side of a mountain in order to expose the seam of coal. Sometimes it means decapitating the mountain altogether—removing 50 to 100 feet of earth and rock from the top of the mountain to reveal the coal seam lying beneath it.

Even the coal industry itself shudders self-consciously about the shoddy mining practices in eastern Kentucky. James Garvey, Vice President of the National Coal Association, testified before the Senate Interior Committee in September 1970: "In the eastern section, TVA has taken advantage of the willingness of non-career coal companies to 'cream the contours.' TVA in its eastern section has lived off the very inexpensive coal which could be, and was, obtained from strip mining the contours of the hills."

Ken Hechler is a congressman from West Virginia. He has introduced a bill in Congress that would ban all strip mining in the U.S. by 6 months after its enactment and authorize 90 percent federal matching funds to states for reclamation of land that already has been stripped.

The earth and rock that are cut and blasted away to expose the coal are cast over the side of the hill in great, unstable aprons of rock, leaving mud and debris clinging perilously to the slopes. Rains carry some of these materials into the watercourses and streams. The result is an alarming threat of floods throughout the strip-mined regions. Acid and mineral pollution are equally severe problems in strip-mined areas. The rocks and shales adjacent to the coal seams include pyritic rock, which is a potent producer of acid, iron pollution, and other forms of mineral pollution.

The U.S. Geological Survey completed a thorough scientific study this spring of the area where TVA purchases huge amounts of strip-mined coal. Entitled "Influences of Strip Mining on the Hydrologic Environment of Parts of Beaver Creek Basin, Kentucky," the study fully documents the appalling destruction of the land and streams. In strip-mined areas, the rains washed away 27,000 tons of earth per square mile each year, contrasted to 1,900 tons in areas where strip mining had not occurred. Minerals washed out of the earth at a rate of 1,370 tons per square mile in stripped areas, contrasted to 111 tons in nonstripped areas. These highly acid conditions killed all fish and nearly all plant life in the stream affected by the strip mining. Six years after the stripping had been concluded, these conditions were largely unchanged and nature had not, as some contend, "healed its own wounds." The growth of trees and plants on the stripped areas also was retarded by the acid quality of the water.

The social cost of strip mining is as appalling as the cost to the earth itself. The ancient "broad-form deeds" under which mineral rights were bought entitle the coal operator to remove coal from the earth by any means whatsoever. Thus a farm-owner may find his property destroyed in the greedy search for surface coal.

On March 1, 1971, three environmental groups—Natural Resources Defense Council, Environmental Defense Fund, and Sierra Club—filed suit in U.S. District Court in New York to enjoin TVA from purchasing strip-mined coal in Kentucky and Tennessee. The suit also charged that TVA was in violation of the National Environmental Policy Act, signed by the President on January 1, 1970. The Act instructs agencies of government to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations," and to "attain the widest range of beneficial uses of the environment without degradation," and also to "enhance the quality of renewable resources." Under the National Environmental Policy Act, federal agencies are required to file an environmental statement on any major action that significantly affects the quality of the human environment or has any irreversible and irretrievable impact on resources. The environmental groups correctly pointed out and charged in their suit that TVA had never filed such a specific environmental statement, despite the fact that in other actions TVA showed awareness that strip mining does have a damaging effect upon the environment. The plaintiffs pointed out that TVA did include reclamation requirements in its contracts with coal suppliers and that in December 1970 it made some of its mining and reclamation regulations more stringent.

The suit had a dramatic effect upon the Tennessee Valley Authority. On March 26, 1971, the Washington representative of TVA sent me a document dated simply March 1971, entitled "Policies Relating to Sources of Coal Used by Tennessee Valley Authority for Electric Power Generation," and headed as "Environmental Statement."

It is too early to analyze other effects that the suit, whether or not it is successful, will have on the efforts of TVA to protect the land, soil, hills, forests, and streams that now are being ravaged by the strip mining of coal purchased by TVA. The revised and "toughened" reclamation provisions that TVA published in December 1970 are no doubt superior to the ones they replaced. Yet they contain loopholes such as the following: "Contractor shall, *as closely as practicable following the mining operation*, cover coal faces and bury all toxic materials including coal wastes and strongly acid shales" (emphasis supplied). And also: *"To the maximum extent practicable*, the foregoing work shall be performed at the same time the mining operation is taking place. . ." (emphasis supplied). One can only conclude when viewing the devastation of areas "reclaimed" in eastern Kentucky and other strip-mined areas that the strip miners rarely seemed to find it very "practicable" to restore the land—if indeed that be possible.

The environmental groups that have filed suit against TVA contend that the reclamation requirements contained in TVA contracts with coal suppliers are "tokenism in order to permit the agency to continue a method of extracting coal that is devastating to land in general and destroying the Cumberland Mountains of eastern Kentucky in particular."

If the states in which TVA purchases its strip-mined coal had tough and effective regulations, there would be less to fear from the large contracts that TVA has for coal extracted by this process. In Kentucky, a supposedly tough strip-mining law was passed in 1966, but events have proven the law to be practically worthless. In 1970 strip miners in Kentucky tore up nearly twice as much land as in 1969 (13,000 acres in 1969 and 23,000 acres in 1970), and the early figures for 1971 show that this upward trend is continuing. Kentucky State Reclamation Director Elmore Grim is reporting major problems with mud slides on "reclaimed" mountain slopes. Recent Bethlehem Steel ads in large magazines like *Time* and *Newsweek*, purporting to depict beautiful fishing lakes and recreation areas fashioned out of stripped land, have in some instances been proven somewhat phony. Pat Furgurson of the *Baltimore Sun* recently analyzed a Bethlehem Steel ad in *Time* that revealed in beautiful color a fishing lake entitled "Fishpond Lake" in Kentucky. Furgurson visited the site and found that the photographer must have worked hard for an angle that avoided "coal slides into the water, scars in the mountainside . . . gritty dust blowing from the irreparable gash in the slope opposite."

Whether or not the suit against TVA is successful, it is difficult to argue with the fact that virtually no stream system in the 15 million acres of eastern Kentucky now remains free of mine pollution. The fact is that TVA is buying increasing amounts of strip-mined coal, and so-called reclamation has been largely esthetic in nature, like putting lipstick on a corpse. Through TVA, the federal government is a direct participant in this process of environmental and social destruction. ■

THE MOUNTAINEERS IN THE AFFLUENT SOCIETY

Harry M. Caudill

Only a coal operator can visit the flayed and mutilated hills of eastern Kentucky without feeling grief for their ruin. The ancient hills and valleys nurture an incredibly old and complex web of life that reached its present form millions of years ago. The ice sheets brought an immense variety of plants and living creatures to the hills, where a benign environment embraced and shielded them. Fifty million years ago the forest was strikingly like its modern counterpart. More than 2,000 seed-bearing plants—a hundred of them trees—have been identified by plant scientists, far more varieties than are to be found anywhere in Europe or Asia.

Strip mining for coal shatters the ecological balance with a finality that defies description. Explosives, bulldozers, and giant shovels assault the hills cataclysmically, like the barrages of Verdun and the fiery mushrooms of Nagasaki and Hiroshima. Whole ranges are decapitated, gigantic gashes deaden the stumps of ridges, forests are buried, streams are choked with mud and poisonous acids. And, initially at least, the disruption is total. All life flees or is buried, and the hideous heaps of "spoil" lie naked and forlorn. In their natural state no region in the world is lovelier than the Kentucky highlands; but as "development" of strip mines proceeds, they become as ghastly as the rotted face of a corpse.

The last to enter Appalachia's web of life was man. His foot first trod the deep black loam about 5,000 years ago. The red men scarcely marked the hills and lived within them as securely as the elk, buffalo, and black bear that had roamed their solitudes for ages.

The white man was vastly different. He brought the enlarged appetite of an advanced and rapidly expanding technology. For their natural resources he plundered the hills with a murderous efficiency that would have shamed a Roman general. His greed has culminated in the stripping that now reduces much of Appalachia to desolation, a modern Carthage plowed and salted. But whereas the people and culture of Carthage were foreign to the Romans who annihilated them, American industrial man attacks the people and culture of Appalachia—near the heart of his own homeland.

My first brush with stripping occurred in 1949. As a coalfield lawyer I was, of course, accustomed to a social, economic, and political order dominated by absentee mining corporations. But *Russell Fork Coal Company, et al.* v. *Hawkins*, 311 Ky. Decisions 449, 223 S.W. 2nd 887, stunned me with the abrupt realization that in the courts of their native state the mountaineers no longer possess any rights when their adversary is coal.

In the spring and summer of 1946 Russell Fork Coal Company strip mined 10 acres on the top of a hill at the extreme head of Weddington's Fork of Ferrell's Creek in Kentucky. This narrow rugged valley was the home of nearly two dozen

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Harry Caudill, a lifelong resident of eastern Kentucky, is a lawyer, former state legislator, and author. His book *Night Comes to the Cumberlands*, published in 1962 and already a classic, describes the tragic history of the Appalachian mountaineers and their hills. He is a leader in the efforts to halt strip mining practices and improve the lot of the victims—both people and the land—of industrial "progress."

Joseph Smith is an accomplished and well-known artist. An instructor at Pratt Institute in New York City, he recently completed illustrations for a new book in the Sierra Club series, *Survival Songbook*.

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drawings by Joseph Smith

families. They were served by a small general store at the mouth of the valley.

The stripping produced a broad flat on the hilltop with an "island," or round, man-made mesa, at the center. The timber, of course, had been pushed down, shoved over the hill, and covered to a great depth with rubble. In one area a considerable pond of water had collected behind a rim or "berm" of spoil.

On the night of August 2 thunder and lightning roared and flashed along the ridges; and for several hours a sustained, vicious downpour sluiced the dismembered hill. The pond deepened, and the rim broke beneath its weight. Enormous landslides sent cascades of broken stone, loose yellow dirt, and tree trunks roaring into the hollows. Here the gathering fury of the flood propelled the mass into the channel of Weddington's Fork. Witnesses related that the rubble formed a barrier about 15 feet high that rolled like a juggernaut down the valley. Fortunately the people were forewarned and fled for their lives. The tumbling avalanche splintered the houses one by one, adding their fragments to its destructive mass. At last it swept away the little store and poured into the broader channel of Ferrell's Creek. Behind it lay utter ruin for an entire community. The houses and barns had vanished. Gardens and croplands were blanketed with stones and yellow subsoil. The mud from spoil heaps cloaked everything.

The dazed people promptly filed suits for damages under the reasonable belief that the coal company had harmed them. One of the South's greatest trial jurists, R. Monroe Fields (who once sat through an entire 6-year term without a reversal), tried the first case to reach the docket. After receiving the judge's instructions on the applicable law, the jurors returned a verdict for mountaineer Herbie Hawkins and his wife.

But the despoiled inhabitants of Weddington's Fork were to have no redress. Those masters of jurisprudence who composed the state's high court, the Court of Appeals, ordered a reversal. In what an earlier time would have treated as blasphemy, the judges termed the catastrophe an "act of God." It was adjudged that an exceptionally heavy rain, and hence the deity, had caused the damage. The coal company was absolved of all liability and freed to devote its energies to another mountain.

This medieval ruling since has been bolstered by many other decisions. On at least 90 percent of the land, title to the underlying coal and other valuable minerals is held by companies that bought it generations ago. At the turn of the century when the mountaineers sold mineral rights to their land for a pittance, strip mining was unknown. Mountaineers and coal companies both envisioned traditional mine shafts and underground digging. The "broad-form deeds" covering the transactions entitle the operator to remove the coal "by any means convenient or necessary." Consequently, the resident mountaineers own only the "surface estate." The Court of Appeals has opined that the owner of the minerals has a right to get out *all* of them, if necessary by strip mining or other processes that totally destroy the land. The owner of the soil and trees is entitled to compensation for his loss only if he can prove the company acted "wantonly or arbitrarily."

Fortunately no other state has burdened itself and its people with these kinds of horrifying decisions, but such rulings have brought destruction and despair to thousands of Kentuckians. The courts afford them no relief for the ever-spreading devastation of their land, and their every effort to protect the earth has brought down upon them swarms of armed officers to protect the "rights" of the strippers.

In the spring of 1952 Pittsburgh Consolidation Coal Company was stripping on Beefhide Creek, then an unbelievably wild and lovely valley in the Elkhorn coalfield. One hundred and sixteen voters made their homes there, and a little white-framed school provided a measure of education for their children. Descendants of the first settlers, they worked in mines, farmed the hillslopes and narrow bottoms, attended their fundamentalist churches, buried their dead in graveyards on cedar-darkened knolls, and knew a peaceful self-reliance that since has utterly vanished from the coal counties. It vanished from Beefhide Creek with the thunderous explosions that "cast the overburden" of rock and soil from atop the coal and flung it into the valley.

On a sunny afternoon a distraught man, still in the coal-blackened garb of a miner, appeared at my office. He had ended his work shift and returned to his home to find it a wreck and his frightened family huddled at the home of a neighbor. He wanted me to go with him to see with my own eyes the plight to which they had been reduced.

We drove the 22 winding miles and found a huge tawny cloud of dust from the shattered hill still drifting down the valley. The modest, four-room, tin-roofed cottage with its narrow lawn, flowerbed, and vegetable garden was a splintered ruin.

A block of sandstone the size of a bushel had arched upward from the explosion on the ridge in front of the house and plunged through the roof into a bedroom. It struck the center of a counterpaned featherbed, carrying it and the iron bedstead through a gaping hole into the earth below. The terrific impact had sagged the floors; pulled the walls inward; turned over stove, refrigerator, and chairs; and knocked out electric power.

Outside, a lesser stone had bounced off the top of the battered family sedan, pressing it flat against the steering wheel. Rocks littered lawn and garden, and a rooster lay where a piece of slate had crushed him.

My friend got a flashlight from his pickup truck and led me around the slope to the little plot where his parents were buried. An immense shard of rock had shattered the tombstone above the bones of his mother and then buried itself deep in the yellow mound. The grave had collapsed downward through old, rotted boards, but a finger of light poked through the darkness by the edge of the missile. It revealed a thin-shouldered skeleton with bony fingers crossed on a black dress.

On the hill a bulldozer sent boulders crashing through a stand of young tulip trees. The miner wept in outrage and fury.

The stripping went forward relentlessly for another year. The company paid the family a few thousand dollars because, as their agent said, "we like to do the right thing." Worn out and hopeless, they joined the human tide flowing into Cleveland, and only a chimney now marks the place where they lived. Rocks and mud have covered the graveyard, and it is choked with weeds.

The precinct now has fewer than a dozen voters, and the school was abandoned years ago.

Thus the ravages of this monstrous industry came to the jaded and apathetic people of the Kentucky Cumberlands. Worn down by their prolonged isolation, lack of education, archaic attitudes toward government, and by dependency on nonresident landlords for their basic necessities, the mountain people have capitulated in multitudes. Many simply died beneath the weight of the ugly horror that crept like a devouring dragon along the familiar hills. Nearly half of them fled to distant cities, and most of those who remained—mainly the aged, the infirm, the illiterate—now subsist in the shrunken, dying communities. Weak and corrupt state and local officials joined the miners in hope of gaining some of the loot, and no one was left to guard the land.

The TVA with its immense appetite for cheap dirty coal has toiled as a willing accomplice in the ruination of the mountain people. Its suppliers, working in a buyer's market through the 1950s and early 1960s, despoiled whole counties.

In 1965 a coalition of Knott Countians calling themselves the Appalachian Group to Save the Land and People went to the state capitol to complain that stripping was totally impoverishing them. Eighty-year-old Mrs. Bige Ritchie related to Governor Edward Breathitt how the dozers had come to her land. Frail and trembling with age and fatigue, she shouted to the operators that her family cemetery lay immediately in front of them. Big-bellied and hard-hatted, the driver sank the giant blade into the earth and roared ahead. "I liked to have died," she told the spellbound governor, "when the coffin of my child went over the hill and was covered up agin."

This account prompted another member of the group to observe that "the strippers are digging up the dead and burying the living."

Nor do the strippers restrict their depredations to the homes of the poor. In 1965 in Perry County a boulder was sent down a hillside into the home of the county attorney. And many of the scenic overlooks so important to Kentucky's much-touted tourist trade have been destroyed.

Not all mountaineers have accepted quietly such outrages. On a single night at one operation a reported $700,000 worth of mining machinery was dynamited into scrap iron, and at least one dozer operator fell victim to a well-directed shotgun blast from somebody hiding in a thicket.

More than a hundred thousand acres of Kentucky mountain land and its veritable empires of living things have been "disturbed," to use a euphemism dear to the lexicon of strippers. The flow of people out of the hills rolls unchecked into midwestern and northern cities already groaning beneath unassimilated millions. The counties with the most stripping saw population drops of one-third between 1960 and 1970. The land is dotted by hundreds of empty houses and by tattered little communities huddling beneath the sheer slopes of gigantic spoil heaps poised on mounds of uprooted and rotting trees. Japanese, German, and American industrialists have their cheap coal; America's purple mountain majesties are grim, reproachful wrecks; and the nation's welfare rolls have thousands of new names.

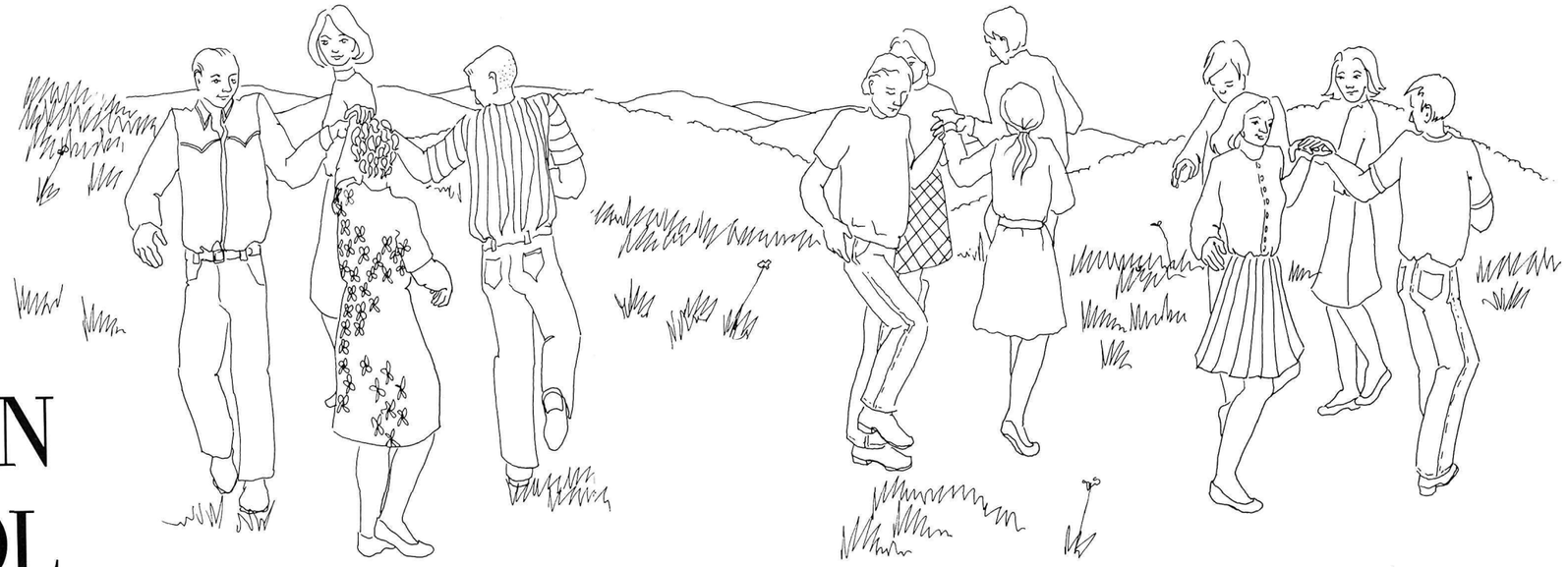
On the night of May 30, 1927, a cloudburst struck eastern Kentucky. Then the hillcrests were in timber and a youthful population could flee the rising waters. Yet more than a hundred people drowned before dawn.

Now those same hilltops are mounded for hundreds of miles with naked, unstable soil. The creeks are silted to their brims; and old, forsaken people cluster in little houses, apprehensively waiting. Appalachia is wet country, and flash floods are common to its history. It requires no gift of prophecy to foretell that sometime—and soon—calamity will strike. The Weddington's Fork experience will be repeated in a vast area embracing not only eastern Kentucky but parts of a half dozen neighboring states. A man-triggered "act of God" is abuilding, and thousands may perish.

Sadly, when the calamity strikes it will engulf no rail, coal, steel, or power tycoons. They will be safely elsewhere, with the directors of TVA and the corrupt politicians who have sold out an entire region to its doom. Only the poor will perish, the Appalachian poor in their strange archaic world—a world devoid of future in what John Kenneth Galbraith has so quaintly termed our "affluent society." ■

John M. Ramsay

APPALACHIAN FOLK SCHOOL



DRAWING BY NANCY MORAN

OUR TRADITIONAL INSTITUTIONS and the newer educational impact from television and other mass media continue to press our young people toward a life with far too little relationship to the communities from which they come. This is true especially in Appalachia where urban materialism contrasts strikingly with rural resources.

Although not surprising, it is disheartening to see the great majority of youth from rural Appalachia leaving their communities for employment in urban areas. More particularly, it is ironic in view of the active interest many urban youth have in the residual Appalachian lifestyle being forsaken by those for whom it is a birthright.

I am one born outside the region who has come in to stay. My heart was captured by the southern highlands when I first entered Berea College, a school in Kentucky for mountain youth. There I found a quality of life that reinforced my childhood training in the Golden Rule and its social consequences.

From an oldtimer whose house is perched on a North Carolina hillside, I learned a golden rule of economics that requires a cultural commitment quite different from the competitive stance of an industrialized society. I call it Derreberry's economic principles: (1) "Hit's worth right smart to have something to do." (2) "I wouldn't want to charge anyone more than I'd want to spend."

Life acquired a different historical perspective to me when I heard vestiges of Elizabethan speech spoken naturally by the "uneducated." The ablative case sends chills of awe through me when I hear it, in the same way that an old loom causes me to ponder what history it could tell.

But more important than the rich heritage found among the hills is the contribution its people could make to a society whose fabric has lost its strength. Answers to competition, specialization, spectatorism, and depersonalization can be found among the hills. Saving the best of the southern highland culture is a conservation issue equally important as protecting streams filled with trout and cherishing clear, starlit nights and productive forests.

What kind of educational program could prepare young people for life at home? Since its founding in 1925 the John C. Campbell Folk School in Brasstown, North Carolina, has addressed itself to this question. Through the late twenties, the Great Depression, World War II, the postwar period, and the present, its program has been tested. Certain principles established by the Danish bishop N. F. S. Grundtvig, founder of the Folk School movement, have proven to be sound and point the way to a school program that can adjust to changing social needs.

- Awakening, enlivening, and enlightening the spirit is a primary purpose of folk school education. Technical expertise becomes a secondary achievement that follows because an awakened spirit will grow on its own. Examinations and credits are an unnecessary interference.
- Utilization of culture in the learning experience expands the personality, creating an understanding of personal identity in the culture and history of man. Life is seen as an integrated whole in time and space. The learning experience prepares one to participate. Economic, spiritual, and cultural matters are studied as integrated and interrelated parts of life. How one makes a living is seen as having everything to do with how one lives.
- A spirit becomes educated through the relationship of personality to personality. The "living word"—the warm, emphatic, spoken word—conveys messages not easily taught through other media. To achieve this, staff and students live together as a family.
- Cooperation and participation are necessary tools of education.

WOODCARVING at the Campbell Folk School began as an idea of Olive Dame Campbell, the school's founder. Hayden Hensley, a student, caught the vision, took pocket knife in hand, and carved a goose with a slender, whittled neck. Currently, 44 men and women living within a 10-mile radius of the school are known as the Brasstown Carvers. They learned to carve and now sell their products through the school to an appreciative market.

This is an example of an economic program that complements the better features of rural living. The carving is done at home; the craftsmen are self-employed, with husbands and wives often working together. Children help with sanding and learn the use of the knife early. The colors and grains of native hardwoods enhance the beauty of the farm and woodland figures for which the carvers have become famous.

The cool nights resulting from our high elevation and the fertility of the clay soil base give our section of the mountains a particular advantage in producing trellis tomatoes. Vine-ripened tomatoes grown near the Smoky Mountains have especially fine flavor and can be produced over an unusually long season. Tomato cultivation adapts as a family enterprise, requires only modest capital outlay, and utilizes garden skills traditional to our neighbors. Small amounts of land, a necessity in this hilly section of limited holdings, and intensive hand labor complete the picture of another economic enterprise that fits the natural and cultural resources of the area. Classes funded through the Manpower Development and Training Act supply up-to-date information for tomato growers.

Development of such industries is not easy. The Folk School encouraged George Kelischek, a master violin maker from Germany, to build a beautiful new workshop in Brasstown. When building loans for his combination home-workshop could not be arranged through the state Department of Conservation and Development (because somehow industrial concepts dictate that a man should not live where he works), private financing was arranged; and Kelischek is now employing three local craftsmen. Music, always a strong feature of Appalachian life, has received a new dimension in Brasstown through Kelischek's skill.

The school is experimenting with a homemade greenhouse, a travel trailer park, sorghum molasses production, a community cannery, and other enterprises, measuring each in terms of how it fits into the pattern of life. Although we have done no more than talk about it, we are intrigued with the possibilities of small industrial enterprises that might suit the area. Could men become keypunch operators? Could they work a 4-hour day so twice as many might be employed and half a day would then be available to them for rural pursuits?

A recreation movement has grown out of Folk School interests. Community dances are held weekly. It seems natural to us that parents and children choose each other for partners. Children 2 and 3 years of age grow up in a spirit of cooperative fellowship and become participants rather than spectators.

We especially enjoy those activities learned from our older neighbors. The ancient modal tunes, cleverly told tales, and lively Appalachian dances have a special charm because we have inherited them and know their roots. However, we have not limited ourselves to Appalachian folk material. We no longer care to do one dance all night long! The recorder, a Renaissance instrument, takes its place in our program along with the Appalachian dulcimer. We enjoy the Danish singing game "Rosalil" as well as "Old Betty Larkin" and "Going to Boston." We find as much excitement in a well-executed English sword dance as in fast-paced Appalachian "set running."

The recreation material is related to other Folk School pursuits. A program we recently produced showed the thread of relationship between Shakespeare and mountain fiddling!

CERTAINLY this is a different sort of school. Programs in woodcarving, trellis tomato growing, and community dances are not commonly associated with educational institutions. But the form continues to evolve and change. Over the years the Folk School has become a way of life, and a generation of students has taken its place in the community. Many of our present staff were students in the prewar days.

To meet the needs of today we have established a new boarding program, Internships for Rural Living. Through it we have assisted a number of colleges in giving their students the stimulating experience of a real community project, outside the classroom. The program is designed for the 18- to 30-year-old. Each intern is given, or identifies on his own, an experience-service-learning assignment.

Through service, the intern finds a deep need to understand himself, to be effective, and to touch the lives of other people. Human relations and personal growth rightfully attain priority as the primary educational concern of the program. Through experience, patterns of personal growth are developed, and foundations for future growth are laid. Learning arises from the service-experience. Facts sort themselves into meaningful order and are more easily digested and retained because they are needed and are put to work in the community.

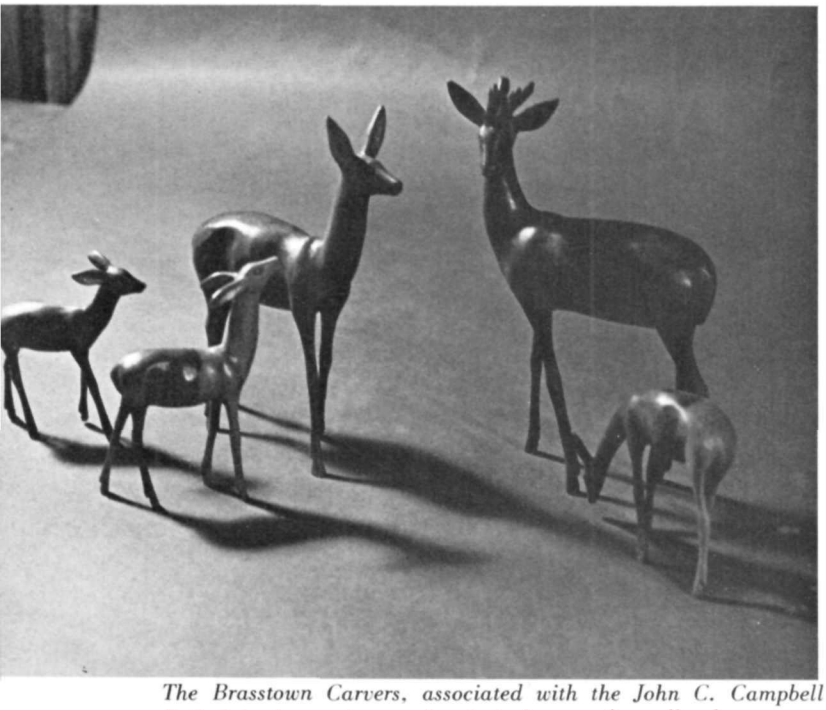
Interns have served as important manpower sources for tackling community problems that otherwise would remain untouched. Several have worked in public schools offering special classes for students. They have held classes for students on the verge of dropping out. Others have prepared music and art classes in schools with limited programs. An intern under College Work Study, a federally funded program, studied the zoning needs of Clay County, working with the county commissioners. Two other interns worked with our blacksmith to develop a harvesting machine for sorghum molasses cane.

Higher education in the United States is showing increasing interest in service-learning as a legitimate educational method. The southern highlands, through the John C. Campbell Folk School, Mars Hill College, Alice Lloyd College, Berea College, the Settlement Institutions of Appalachia, and other organizations are showing mountain ingenuity and independent spirit in exploring service-learning, in most cases with scanty financial assistance. The Southern Regional Education Board, Dartmouth College, and Appalachian Regional Commission have pioneered and cooperated.

A new American Studies Term will allow the Folk School to address its program more directly to all Americans, not merely natives of Appalachia. We will be looking for the American spirit in literature, history, and the sweep of events surrounding us.

Public school structures in the rural southern highlands—and in the rest of the nation as well—are in need of innovative change. Present curricula stress academic achievement and teach the mores of an industrial society. In an age of rapid change we can not afford to prepare our children for the outdated industrial revolution. We can scarcely prepare them for today's world. We must look farther ahead.

I see in the future a desperate need for personalization and integrity, for community, for cooperation. How do we prepare children for this? One way is through schools like the John C. Campbell Folk School. ■

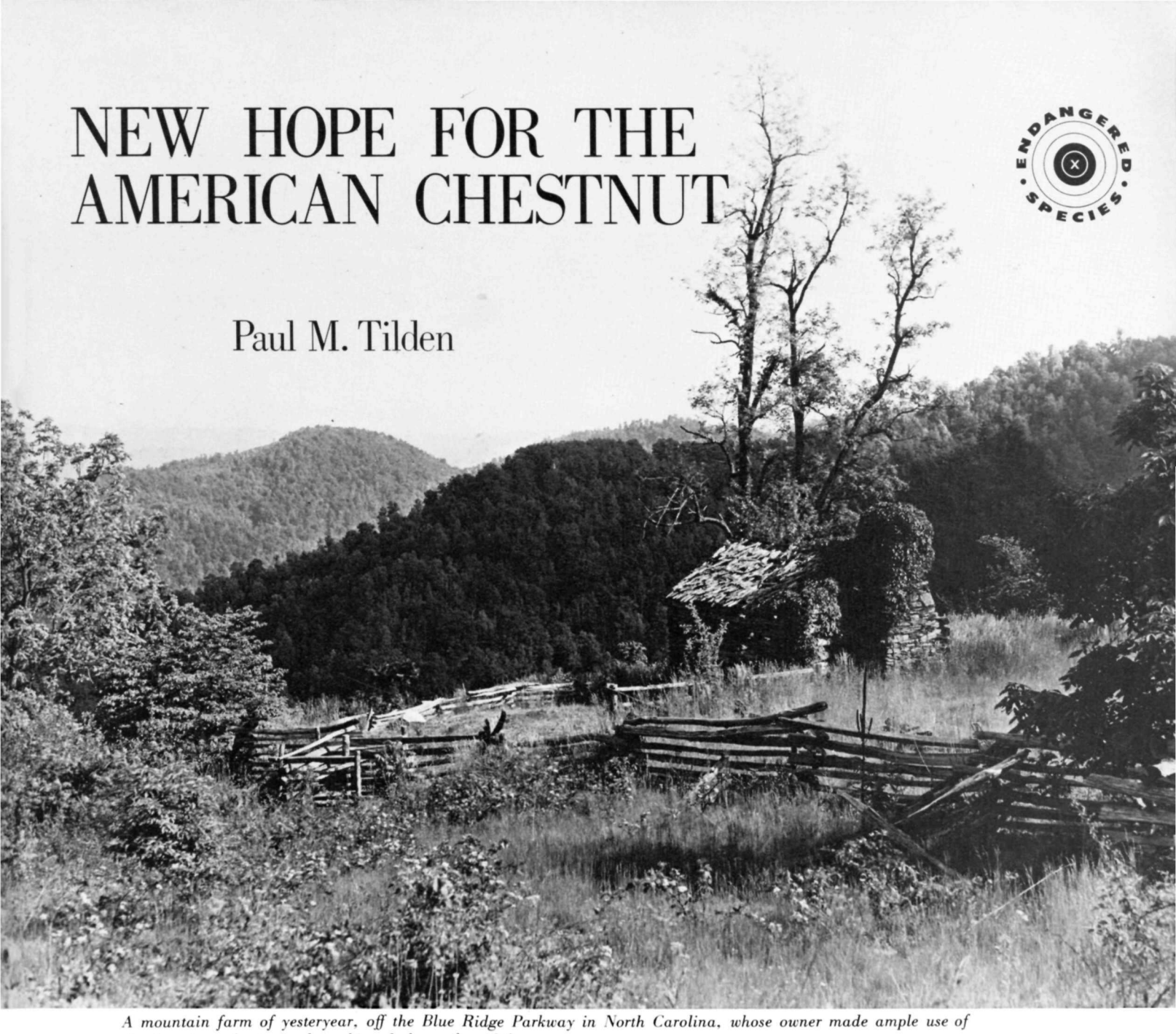


The Brasstown Carvers, associated with the John C. Campbell Folk School, are famous for their figures of woodland creatures, hand-carved from native hardwoods.

John Ramsay has been director of the John C. Campbell Folk School since 1967. He is a graduate of Berea College in Kentucky and received his Ph. D. from Iowa State University. Indicative of his major interests are his chairmanship of the Settlement Institutions of Appalachia, representation on the board of the Country Dance and Song Society of America, and membership in the America Dairy Science Association.

NEW HOPE FOR THE AMERICAN CHESTNUT

Paul M. Tilden



A mountain farm of yesteryear, off the Blue Ridge Parkway in North Carolina, whose owner made ample use of the American chestnut—for cabin, shake roof, and fence.

One day during the summer of 1904 the chief forester of New York City's Zoological Park, Herman Merkel, noticed that a number of the park's American chestnut trees were developing yellowed leaves and a generally unhealthy appearance. On examining them more closely, Merkel was disturbed to discover that the trunks of each of the ailing trees showed small islands of dry, dead bark, clearly outlined against the healthy, dark olive-green of the normal trunk. The sunken patches of bark were, he saw, festooned with myriad orange pinpoints, obviously the fruiting bodies of a fungus.

It would be overly romantic to think that Merkel was gifted with second sight and that he might at that moment have had a premonition of some great botanical tragedy to come. It is more likely that it was Merkel the competent forester who immediately ordered the sick trees sprayed with a commonly used fungicide, copper sulphate, and who bundled off some samples of the dying wood to the experts at the Department of Agriculture.

In due course the Department returned a rather vague finding. Merkel's chestnuts were being attacked by some species of the fungus *Endothia*—the exact species was not clear to the experts—and the little orange pustules that dotted the dead samples were ascospores, one of the two kinds of fruiting bodies produced by the fungus. (The ascospores release their seed directly into the air, to be carried by the wind; the other type of reproductive organ, the pycnospore, produces a pasty substance that adheres

to the feet of birds and animals, who thus act as vehicles for the spores.)

There ensued an argument that lasted for many years among plant pathologists over the nature of Merkel's fungus. Some declared that it was a deadly mutation of one or another of the several native species of *Endothia*, historically harmless to the American chestnut. Others said it was more likely a race of *E. radicalis*, native to Europe and likewise harmless to the European or Spanish chestnut, which had gained a foothold in America and was attacking the American tree.

The latter supposition foundered when it was shown that a culture of the new fungus immediately destroyed the Spanish chestnut trees inoculated with it, and plant scientists began to look toward the Orient as the remaining likely source of the infection. In a brillant bit of botanical detective work, the two investigators, Haven Metcalf and C. L. Shear, with the assistance of plant explorer Frank Meyer, who was then in China, finally established the fungus as *E. parasitica*, native to China and Japan; and it was speculated that it may have arrived in New York City with a shipment of Japanese nursery stock at about the turn of the century.

While these speculations and investigations were going on, however, the fungus was creating ever-widening circles of havoc among the American chestnuts of the northeastern states. The discovery of its true nature and origin was by then far too late. Ten years after Merkel's fateful discovery the chestnut blight, as it came to be called, had invaded and wrecked the chestnut over all its natural range in New England, New York, northern Pennsylvania, and northern New Jersey and had made spotty appearances as far south as Virginia and West Virginia. In Pennsylvania, authorities made a desperate attempt to halt the advancing fungus by creating a 10-mile-wide "sanitary zone" across the state in which every chestnut, living, dying, and dead, was destroyed. In retrospect, the time and money were spent on a hopeless task. The parasite was being carried south and west on every summer breeze from the north and east and more slowly but just as inexorably by the feet and fur of countless wild animals.

By the middle of the twentieth century the ruination of the chestnut as a forest tree had been completed in what must be thought of as the greatest botanical disaster of recorded history. From southern Maine to central Alabama, from eastern Virginia to the Mississippi, the chestnut forest was a shambles of gray, barkless trunks and limbs, a ghost forest that would stand for decades as a monument to man's ecological carelessness.

If the loss of the American chestnut was an affront to nature and a human tragedy in the esthetic sense, it also had a direct and profound effect on the lives of the people of Appalachia, heartland of the species. From the Alleghenies of Pennsylvania and West Virginia, down through the Blue Ridge of Virginia and North Carolina, through the Pisgahs and the Craggies and the Great Smokies, the lives and fortunes of several millions of humans were tied, directly or subtly, to this great forest tree.

Commercial uses of the American chestnut were many and varied. The ageless strength of its wood recommended it for telephone poles, railroad ties, mine timbers, fencing, tool handles—every application requiring a combination of strength and durability. Millions of board feet were used every year for beautiful interior trim. The tree is exceptionally rich in tannin, and the seemingly endless chestnut forest of Appalachia supported some of the greatest tanneries in the world, like the huge works at Old Fort, North Carolina, which specialized in making sole leather for shoes.

Throughout the length and breadth of this great mountain province, the chestnut was near to being all things to all men. A writer has described its importance in the life and economy of Appalachia thus: "The chestnut was ready money in a part of America where ready money has never come easily. There was a steady market for the nuts in the big city, while the gathering and sale of chestnut bark for the extraction of its profuse tannin occupied the slack days of winter. The cabin of the mountain farm was framed and logged in with chestnut, and its roof covered with shakes of the same wood, rived out of specially selected trees. To keep the hogs from straying the property was fenced with chestnut rails, and the animals fattened on the nuts themselves. When the mountain man took final leave of his cabin and his clearing, his casket was likely to be fashioned of rude chestnut boards."

As bad as was the loss of the tree in a physical sense, there was a more subtle and even worse effect on the people of Appalachia. For, in order to make good the loss of needed cash income, small as it might be, some of the hill people turned to the manufacture of illicit whisky. This alternative, of course, brought them into immediate conflict with various tax-gathering agencies. The stereotype of the mountain man and his streamside still, so amusing to many Americans over the years, never has provided as much humor in Appalachia as elsewhere; for, during years when the poor soil of the upland hillsides produced little more than a crop of cobblestones, the possibilities for other gainful employment were slim indeed.

In view of the economic and social importance of the tree, not to mention the less easily defined esthetic considerations involved in its loss, it is not surprising that conservationists and scientists began to ask quite early whether the astonishing damage could ever be repaired; and if so, how.

Attempts to answer this question began to develop along two general lines even before the blight wholly had completed its destructive work. The first theory was that over a period of time—a very long period, perhaps—the tree would work its way out of the difficulty through natural processes of selection. Some chestnuts seemed to have more resistance to the blight than others; and these trees, if they lasted long enough, might eventually produce a blight-resistant race of trees.

Dr. J. Russell Smith, of Swarthmore College, agreed with this approach but expanded on it significantly. The natural process of genetic selection could use a helping human hand, Dr. Smith believed; and he advocated a long-term program of chestnut propagation from trees showing any slight degree of blight resistance. Given sufficient time and money, he said, "I could produce an effective blight-resistant strain of the American chestnut."

The second approach to the situation was based on the proposition that there was no longer any hope for the American chestnut as such; that a new blight-resistant forest tree should be developed to replace it. Such a tree, said proponents, would probably be a hybrid between the American

species, *Castanea dentata*, and one or perhaps both of the two blight-resistant Oriental species—the Chinese chestnut, *C. mollissima*, and the Japanese chestnut, *C. crenata*. The Chinese tree produces good nuts, but the Japanese tree is more of a forest tree than the Chinese, neither species is a timber tree.

In 1928, the Department of Agriculture commenced active pursuit of the second approach, with two stated objectives: to restore a timber chestnut to America's forests that also would be a good nut tree. This program continued over several decades, during which thousands of crosses and backcrosses were made between the American species and nearly all the other members of the genus: the Allegheny chinkapin; the Henry chinkapin of the Orient; the Seguin chinkapin, also of the Orient; the Chinese and Japanese species; and even the European or Spanish chestnut, itself highly susceptible to the blight.

It was all to no avail. The genetic characteristics of the various trees led to offspring that were good timber trees, or good nut trees, or blight-resistant trees; but not a combination of all three. Finally the Department gave up and suggested that if people wanted chestnuts to eat, they should plant the Chinese species.

Much other investigative and experimental work has been done, some of which continues to the present. For example, what determines whether a species of *Castanea* is blight-susceptible or blight-resistant? The Chinese and Japanese trees presumably are resistant because they have been exposed to *Endothia* for thousands of years and have developed some chemical or other defense against its attack. If the defense is chemical, what is the chemical? Could it be of assistance in work with the American chestnut?

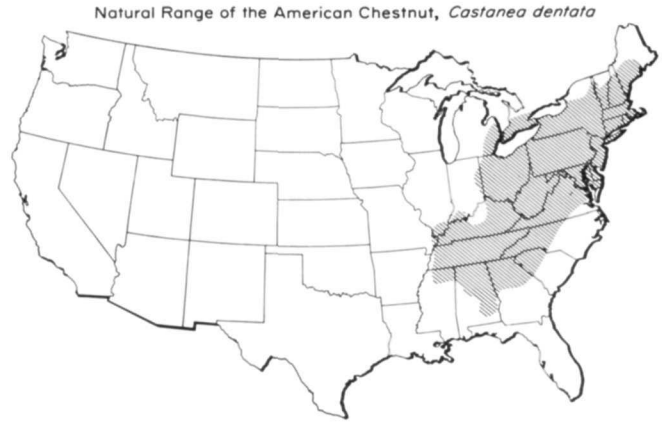
Another line of research has centered around radiation-induced mutations of the genes in native chestnut seed, and an experimental planting of young trees from irradiated seed has already been set out in Maryland.

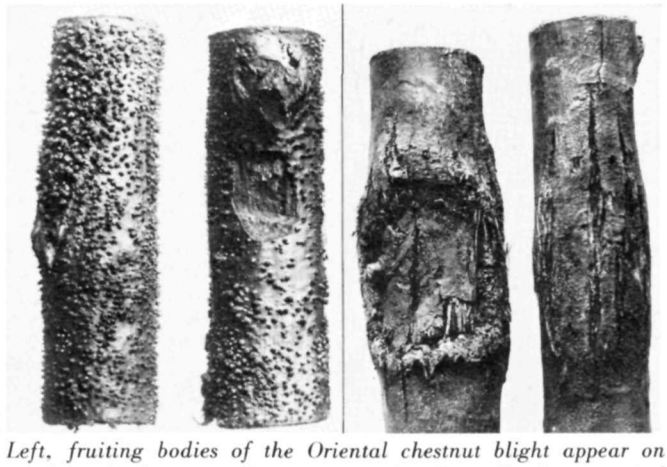
In reviewing the history of the American chestnut disaster and the proposals for its remedy, several facts impress themselves clearly on students of the subject.

First, there has been a notable lack of unanimity on what ought to be done, with attendant dilution of the whole effort. Do we want a blight-resistant American chestnut no matter how long it takes to get it, or do we want an American-exotic hybrid? Or shall we simply content ourselves with the Chinese chestnut and agree with the Department of Agriculture and some others that the job cannot be done—that the native tree is doomed?

The second important point is the past outstanding disinclination in conservation and scientific circles toward raising public interest in American chestnut restoration. With public interest comes the possibility of adequate funding; and the painstaking work that has been done over the decades has all had one hallmark in common—it has been carried out on a shoestring. The little publicity that has been given the subject has been contributed by an occasional newsman or free-lance writer and usually has served only to further confuse objectives.

In the spring of 1966, the National Parks Association, now the National Parks & Conservation Association, proposed and launched a program for the restoration, over its original





DEPARTMENT OF AGRICULTURE

Left, fruiting bodies of the Oriental chestnut blight appear on trunks or limbs as small orange pustules that will release myriad spores to the wind. A second type of reproductive body produced by this fungus exudes a sticky, spore-filled substance that clings to the feet, fur, and feathers of forest dwellers, who act as agents in the spread of the parasite. Right, the internal destruction of tissues in the chestnut by the blight fungus produces a swollen canker that, when completely circling a trunk, kills the tree.

P. M. TILDEN

The weathered wreckage of the American chestnut, which still litters the forest floor of Appalachian slopes, is grim witness to the greatest botanical disaster of recorded history.

ALL PHOTOS BY P. M. TILDEN

The history of the American chestnut over the past five decades may be read in the photograph at the left, taken in the Blue Ridge of Virginia in April 1971. Root sprouts from a long-dead chestnut have produced several generations of young trees, successively killed by the blight after loss of juvenile immunity. The dead sprout in the foreground shows typical lesions of the killer fungus. Just to the right of the dead sprout is a living shoot, which will be blighted in due course. Sometimes a chestnut root-sprout escapes the blight long enough to produce a small crop of burrs, as in the photo above left, taken in Shenandoah National Park. Such burrs, borne on isolated young trees, seldom contain viable nuts because the species is nearly self-sterile; there must be cross-pollination to produce matured fruit. The future of the American chestnut rests with occasional trees that show some blight resistance, such as the specimen, above right, photographed in the Blue Ridge of Madison County, Virginia. It is probably 25 to 30 years old and has survived repeated attacks of the chestnut blight, as evidenced by the many scars on its trunk. But, as usual in such cases, nuts are aborted by lack of cross-pollination.

range, of the American chestnut. An article appeared in the NPCA magazine advocating a new and much more intensive program to get the job done. To those who have said "impossible," the Association replied that on the basis of the evidence, restoration is both possible and feasible. The approach would be by the genetic selection route, using seed from such few bearing chestnuts as remain on the fringes of original chestnut habitat and, most important, from the few forest specimens that have persisted despite repeated attacks of *Endothia.* These latter trees are critical to the success of the program. A systematic inventory of such trees must be made as a vital first step toward eventual restoration of the chestnut; and all possible assistance from national park, national forest, and private forest rangers and other forestry personnel might well be solicited in this slow but essential effort. If the objection were made that the program might require two centuries, the answer would be: then let it be so.

During the fall of 1969, the Association sponsored a symposium on the American chestnut at the beautiful preserve of Stronghold in Frederick County, Maryland. At this gathering, which was attended by many scientists, foresters, and conservationists concerned with chestnut experimentation, the Association outlined its genetic-selection approach to restoration and heard the views of others. The Association's program and publicity already have provided a badly needed stimulus and an equally needed sense of direction for the American chestnut effort, which obviously must be pressed while the tree still exists.

Thoreau once wrote: "When chestnuts were ripe, I laid up half a bushel for winter. It was very exciting at that season to roam the then boundless chestnut woods . . . with a bag on my shoulder, and a stick to open burrs with in my hand . . . amid the rustling of leaves and the loud reproofs of the red squirrels and the jays. . . ."

The present generation has never had an opportunity to share Thoreau's pleasure and excitement in the chestnut gathering; but with patience, interest, and generosity on the part of the American public, it is likely that future generations will. ■

Paul M. Tilden, consulting editor of *National Parks & Conservation Magazine*, has been involved for many years in the conservation movement. He was formerly editor of *National Parks Magazine* and before that associate editor of *Natural History Magazine*.

npca at work

SEA-LAW BRIEFING HELD

The Association was host to a meeting of the Environmental Coalition for North America (ENCONA), held for the purpose of briefing Coalition members on the upcoming United Nations Conference on the Law of the Sea.

The ENCONA members met with John R. Stevenson, legal advisor to the Secretary of State, and Ambassador Donald L. McKernan, special assistant to the Secretary for fisheries and wildlife. Mr. Stevenson is chairman of the U.S. delegation to the U.N. conference, scheduled for 1973. He is also chairman of the Interagency Task Force on the Law of the Sea. Presiding at the meeting was NPCA President A. W. Smith, chairman of ENCONA's steering committee. Also at the conference table were Dr. Harold J. Coolidge, president of the International Union for the Conservation of Nature and an NPCA trustee, and Dr. Francis A. Young, member of NPCA's executive committee.

Mr. Stevenson pointed out that the need for a uniform law governing the sea is critical. He described the proposal for an international agency that would oversee navigation, fishing, scientific research, exploitation of the seabed, conservation of resources, and control of pollution. Infractions of this agency's regulations would be brought before an international tribunal.

ASSOCIATION COMMENTS ON GREAT SMOKIES PARK PLAN

The National Park Service has proposed a new transportation plan for the Great Smokies National Park that would resolve the decades-old controversy over a new transmountain road. The plan involves construction of a circumferential parkway around the park, the closing of the existing transmountain road to cars in the daytime, and the use of busses to carry visitors into the park. In response to a Park Service request for comments on the plan, the Association applauded the Service for a "forward looking" proposal:

"The National Parks and Conservation Association strongly endorses the basic concepts set forth by the National Park Service in its proposal for a circumferential highway for the Great Smoky Mountains National Park. . . . Particularly encouraging is the Park Service's recognition that private automobile traffic is already a burden on the park and should be curtailed immediately. Also encouraging is the affirmation by the National Park Service of the principle of relying on private development outside the park to provide camping and other recreational facilities."

Noting that part of the circumferential road system, to be called the Foothills Parkway, already exists, the Association said this part "gives the visitor a fine view of the Smokies and demonstrates quite forcefully that it is not necessary to drive through the park itself to fully appreciate its grandeur."

The Park Service has recommended building new roads on U.S. Forest Service land for commercial traffic in those instances where the parkway would utilize the only route presently existing. The Association suggests instead that as commercial traffic along the stretches involved is likely to be light, trucks be allowed to use the parkway. This would avoid the additional roadbuilding. If roads so used cannot officially be designated parkway, the affected portions could nevertheless be maintained as de facto parkway.

"The recommendation to eliminate daylight private automobile traffic from U.S. 441, the transmountain highway, is a sound one and this plan should be implemented promptly," the Association commented. "With the completion of Interstate 40 along the eastern end of the park, it is easy for through traffic to make the trip around the park. . . . In addition, the public transport system should circulate on the circumferential highway, thereby making it possible for campers to leave from one of the variety of access points along the parkway and hike through the park to other trail heads. Private vehicles should be banned from all other internal park routes."

Noting that development within the park of visitor facilities has generally been kept to a minimum, the Association urges that all additional plans for development be abandoned. Specifically, plans for additional visitor facilities at Cataloochee and Monteith should be scrapped.

CONSERVATIONISTS OPPOSE HIGHER ROSS DAM

The National Parks and Conservation Association has joined once again with the North Cascades Conservation Council in opposing the raising of Ross Dam in the North Cascades.

Seattle City Light has applied to the Federal Power Commission for permission to raise Ross Dam on the Skagit River by 122½ feet, for the purpose of additional power generation. This would flood 6 miles of the Big Beaver Creek valley in the North Cascades National Park and Recreation Area complex. The valley is wilderness containing beaver ponds, marshes, and impressive stands of western red cedar, including some giant cedars over 1,000 years old. Also flooded would be 6,000 acres of the upper Skagit Valley in Canada. This, described as prime recreation land, is in the center of a proposed new Canadian national park that would adjoin the Manning Provincial Park, the North Cascades park complex, and the Pasayten Wilderness Area. With the raised dam in operation, periodic drawdowns would expose miles of silt and stumps where the wilderness used to be.

Hearings on the proposal to raise the dam were held in June by the International Joint Commission for Canada and the United States. Earlier hearings were held by the Washington State Ecological Commission. NPCA was represented at both by the North Cascades Conservation Council, and in addition at the Ecological Commission hearings by John Osseward, NPCA trustee. The prospect is for a drawn-out series of hearings before the FPC along the lines of the Hell's Canyon controversy, and conservationists trying to stop the dam enlargement estimate that $50,000 is needed to carry on the fight. It is a pity that this sort of time and money will have to be spent fighting a project conceived in 1925 and now demonstrably obsolete. As Seattle Mayor Wes Uhlman aptly put it in a letter to the Seattle City Council opposing the dam project, "Our decision on High Ross will, in fact, have no bearing on any power deficits. . . . I simply do not want to commit myself to 1925 *priorities*. . . ."

NPCA STAFF APPOINTMENTS

Three new members have been added to the Association's full-time staff. Peter A. Twight fills the newly created position of administrative assistant for forestry. A graduate of the University of California at Berkeley's School of Forestry and Conservation, Mr. Twight also served as a teaching associate there. He has a broad background in forestry, having worked in several capacities with the U.S. Forest Service—as a naturalist, recreation assistant, forester, fire prevention technician, and trail construction contractor.

Janet Schaeffer joins the editorial office as staff editor. She came to NPCA from Environmental Action, where she served as a writer and coeditor of the biweekly magazine of the same name. She is a graduate of Brown University.

Ledlie Dinsmore has assumed the duties of administrative assistant for legislative information. Miss Dinsmore is a graduate of Smith College and spent 7 years as an editorial researcher and filmstrip writer for the National Geographic Society. In this capacity she compiled information for various articles about national parks and wrote a filmstrip entitled "Struggle for Survival" about vanishing birdlife in the United States.

PARK PROPOSED FOR PACIFIC TRUST TERRITORY

The Association is supporting a study in the Palau Islands aimed at the eventual establishment of a park in Palau's Seventy Islands area. Messrs. Seth Pierrepont and Steve Johnson will spend this summer in the island group preparing a report on Seventy Islands' suitability as a permanent biological and scenic preserve.

The Palau Islands are part of the vast Pacific Island Trust Territory administered by the United States for the United Nations on a permanent basis. Though the status envisioned for Seventy Islands would be similar to that of a U.S. National Park, the area would be administered not by the National Park Service but through the Trust.

With the advent of air travel the islands of the Pacific are feeling the impact of tourism. In many cases development is at the whim of the developer. There is great need for protection of the outstanding natural values of the Pacific's scattered flecks of land before there is a hot-dog stand on every one.

WORLD TOUR

Plans are well advanced for the NPCA World Tour which leaves New York on September 25. With an overnight breather in Honolulu, the tour goes into high gear in Tokyo the following day.

The emphasis of this tour will be on people and their environment. The leaders of the tour, Mr. and Mrs. Robert C. Cook, have personal contacts with authorities in population and genetics in all the countries to be visited.

The tour will take seven weeks and will visit Japan, Hong Kong (including the "new territories"), Thailand, Nepal, India, and Iran. The number of participants is limited to 30. Reservations are still available. Write to Travel Department, NPCA, 1701 18th St., N.W., Washington, D.C. 20009.

STORES AID NPCA

Eight major stores owned or controlled by Bullock's of Los Angeles are distributing NPCA material in environmental information booths set up in the stores. The stores are located in major cities across the country.

conservation news

ALASKA PIPELINE REPORTS HIT ECONOMICS, SAFETY

Two new reports critical of the proposed oil pipeline across Alaska, one from the state itself, have appeared even as the Administration seems about to how before the oil industry's demands for a pipeline permit.

The initial coolness of Interior Secretary Rogers Morton that we reported here in April seems to have dissipated. At first he said "I'm a long way from deciding that this pipeline is the way to do it." He said his decision on whether to grant a pipeline permit would be based on national need, not on the internal economics of the oil industry. He noted that though his predecessor, Walter Hickel, was under "tremendous pressure" to approve the pipe, "I am not under those pressures."

Recently, however, Mr. Morton has been talking more of the environmental safeguards he will demand of the pipeline and less of either the need for developing the oil or alternate ways of transporting it. It is expected that he will issue a permit for the pipeline as soon as Interior's environmental impact statement on the pipe has been prepared. Among the high Administration officials calling for construction of the line are Commerce Secretary Maurice Stans, who overruled his own department's environmental scientists. He said the pipe is needed to decrease dependency on Middle Eastern oil, to improve the balance of payments, and to provide jobs in Alaska.

One of the two critical reports undercuts Mr. Stans' argument about jobs. Prepared by the Alaska State Housing Authority under a federal grant, the report concludes that the pipeline would attract thousands of unemployed workers from other states, employ them for about 2½ work seasons, then dump them on the welfare rolls. Far from providing more employment in Alaska, the pipeline would soon lead to increased unemployment, the state report says. It contends that the boom part of the cycle will strain cities' ability to provide services and the bust will leave the pipeline route with a string of abandoned bars, rooming houses, and gas stations. The state report notes that though peak employment on the pipeline will be about 7,500, permanent employes will number only about 300, "equivalent to employment at one of the department stores in Anchorage."

The second report was prepared by economists at Resources for the Future in Washington, a research group financed by the Ford Foundation. The report holds that the route proposed by the oil-company consortium Alyeska is the "least attractive" of a number of alternatives for supplying oil to the nation. It suggests that the reason the oil men are so enthusiastic over bringing oil to the southern port of Valdez is that they plan to sell a large part of the oil to Japan.

The report contends that the Canadian route along the Mackenzie Valley would be able to provide oil to the Midwest cheaper than the trans-Alaska route. This inland route would avoid the massive oil spills that are certain to attend tanker traffic along the west coasts of Canada and the United States. It would also avoid the active earthquake zone that the trans-Alaska pipe would have to cross.

WILDLIFE REFUGE OVERRUN BY DUNE BUGGIES

By July the most apparent fauna in the Back Bay National Wildlife Refuge is likely to be the occupants of hordes of dune buggies and four-wheel-drive vehicles.

The Back Bay refuge, in the city of Virginia Beach, Virginia, was set aside in 1938 as a waterfowl rest stop and wintering area. The refuge extends from the mainland across island-studded Back Bay to the low tide mark on the Atlantic Ocean side of the barrier beach. The dunes and beach in the refuge once protected large numbers of shorebirds, and sea turtles nested there.

Six years ago it was possible to travel down the beach and see no one, no matter what the season. Now the beach is a sandy superhighway, carrying as many as 200 vehicles an hour through the refuge. There have even been fatal auto accidents due to the density and recklessness of the traffic. Under these circumstances, shorebird nesting and reproduction in the refuge has been eliminated. Migrating shorebirds are unable to feed at the water's edge because of heavy traffic, sea turtles will not use the beach, and the former millions of ghost crabs have vanished.

Faced with this situation, the Bureau of Sport Fisheries and Wildlife attempted to close the beach traffic, but local uproar blocked this move. Presently the Bureau says it plans to police the refuge more closely to prevent some of the worst damage, and to work toward eventual closure of the beach to motor vehicles.

This is a classic case of the sort of collision between local and national interests against which conservationists will have to be more and more on guard as population

and leisure time grow. When this refuge was established there was very little local interest in the beach. At that time, or even as little as 6 or 7 years ago, a policy of no motor vehicles in the refuge could have been established with little outcry, the craze for beach driving would never have extended into the refuge, the damage would never have been done, and the Bureau would not have felt the pinch between its obvious duty and local political pressure. Conservationists elsewhere should study their local preserves for signs of impending conflicts that can be headed off at the pass.

TETON SCIENCE SCHOOL'S FIELD BIOLOGY PROGRAM

Based on the assumption that the classroom is a poor substitute for living out-of-doors, a unique summer biology program headquartered in Grand Teton National Park each year offers 15 to 18 students an opportunity to learn in the field. The "field" includes Wyoming's Red Desert, the Wind River Range, both Yellowstone and Grand Teton National Parks, half a dozen national forests, the Beartooth Plateau, and the Snake River.

The Teton Science School, currently in its fifth year of operation, is sponsored by the Teton Mountain School and supported by Jackson-Wilson High School of Wyoming and the Environmental Research Institute. Its educational program focuses on individual research projects related to wildlife and ecosystems of the Jackson Hole area. Field trips cover a third of Wyoming and parts of Idaho and Montana. Students have full library and laboratory facilities.

Students at the school hike the hills, climb the mountains, float the Snake River, and explore the canyons. They camp and fish and collect, they read and write, they analyze and observe. Some return as counselors and teaching assistants.

Director Ted Major is biology instructor at Jackson-Wilson High School. He believes the science school, located in a national park and functioning in full cooperation with the National Park Service, is the only one of its kind. The school leases its site, a main lodge, a laboratory building, and four cabins from the Park Service. Teton Science School enrolls high school students from all parts of the nation who have a "keen interest in field biology."

HIGH SCHOOL STUDENT'S MODEL WOLF STUDY

Intelligent concern about wildlife problems is well demonstrated by a study of the decline of an Iron County, Wisconsin, timber wolf pack. The study was conducted by Richard P. Thiel, a high school student of Waukesha, Wisconsin. Thiel searched old records to determine the wolves' diet and ecological role in the area, and he traced the decline in wolf numbers to 1959, when the last animal was trapped.

Thiel concluded that the cutting of the virgin timber had been a primary factor in the pack's disappearance. The opening of the Forest Service roads with the resulting influx of hunters and trappers had proven the ultimate factor in extermination.

It is encouraging to find young people conducting such well-planned and well-executed studies of environmental problems.

Recipe for PRESERVED CHILDREN (from an Hawaiian cookbook)

Take 1 large field, half a dozen children, 2 or 3 small dogs, a pinch of brook, and some pebbles. Mix the children and dogs well together; put them on the field, stirring constantly. Pour the brook over the pebbles, sprinkle the field with flowers, spread over all a deep blue sky and bake in the sun. When brown, set away to cool in a bath tub.

—A Cook's Tour of Kauai

conservation docket

Three major international scientific meetings are to be held this summer that will have important bearing on conservation in the Pacific. The latter field of concern has been too long neglected, according to Dr. Harold J. Coolidge, president of the International Union for the Conservation of Nature (IUCN). The scientific interest generated by these meetings should lead to the solid planning needed to cope with imminent problems of development and exploitation in the Pacific, he said.

The last but largest of the three meetings will be the Twelfth Pacific Science Congress of the Pacific Science Association (PSA), to be held in Canberra, Australia, from August 18 to September 3 under the sponsorship of the Australian Academy of Science. The meeting marks the 50th anniversary of the PSA. It will be centered around four main themes: productivity and conservation in the Pacific; man in the Pacific; environmental quality and resource management—the political, legal, and administrative realities; and geological structures and mineral resources in the Pacific area. Correspondence concerning the meeting should be addressed to the Twelfth Pacific Science Congress, PO Box 216, Civic Square, A.C.T., Australia 2608.

Prior to the Canberra meeting, and arranged in association with it so that scientists attending either one can go on to Canberra, are meetings in Bogor, Indonesia, from August 12 to 17, and in Noumea, New Caledonia, from August 2 to 14. The Bogor meeting is being arranged by PSA's Standing Committee on Pacific Botany and will be a symposium on planned utilization of lowland tropical forests. Further information may be obtained from Dr. Krajina, Botany Department, University of British Columbia, Vancouver 8, Canada.

The Noumea meeting, held under the auspices of the South Pacific Commission, the IUCN, and the Food and Agriculture Organization, will be concerned with the conservation of reefs and lagoons. Other conservation problems of the islands also will be discussed. It is hoped that conservationists planning to attend the Canberra meeting will come to Noumea first in an advisory capacity. The Commission hopes that the symposium will produce general recommendations to the Pacific trust territories for immediate steps to be taken to protect the Pacific islands' environment. Action is needed urgently. The Commission also hopes that in following years training seminars can be held to deal with particular subjects.

Every Congress considers thousands of bills related to environmental problems. We cannot list them all; therefore, below is a selection of those so far introduced in this Congress, together with their House of Representatives (HR) or Senate (S) numbers and the committee(s) to which each has been referred. Members, as citizens, are free to write to these committees to request that they be put on a list for notification when bills come up for public hearing. When notified of hearings, they can ask to testify or they can submit statements for the record. To obtain copies of bills, write to the House Documents Room, U.S. Capitol, Washington, D.C. 20515, or to the Senate Documents Room, U.S. Capitol, Washington, D.C. 20510. When requesting bills, enclose a self-addressed label.

National park legislation includes bills to enlarge the Sequoia National Park (HR 8057) and one to authorize additions to Sitka National Monument in Alaska (HR 8270). Both bills were referred to the House Interior & Insular Affairs Committee. A bill to establish the Capitol Reef National Park in Utah (HR 8213) was referred to the same committee. A bill had previously been introduced on the subject on the Senate side (S 29) with hearings held by the Parks & Recreation Subcommittee on June 3.

A bill to designate certain lands on the Bankland National Forest in Alabama as wilderness (S 1608) was referred to the Senate Agriculture & Forestry Committee.

Congressman John Dingell introduced a House Joint Resolution (547) to authorize the Secretary of the Interior to study the desirability of establishing a national wildlife refuge in California for the preservation of the California tule elk. Along with other resolutions to this effect (House Joint Resolutions 559, 615, and 616), it was referred to the House Merchant Marine & Fisheries Committee. Senator Alan Cranston introduced a resolution on the Senate side (Senate Joint Resolution 84) which was referred to the Senate Interior Committee.

Bills on both sides of Congress were introduced to establish the Canaveral National Seashore in Florida (HR 7978 and S 1562) and referred to the House and Senate Interior & Insular Affairs Committees. A new bill to establish the Gateway National Seashore in New York and New Jersey (S 1852) was introduced, joining many similar bills on the House side. Hearings have been held by the Senate Interior & Insular Affairs Subcommittee on Parks and Recreation on Senator Jacob Javit's bill (S 1193). In January bills to provide separately for a Sandy Hook National Seashore in New Jersey (HR 1370 and S 543) were referred to the House and Senate Interior & Insular Affairs Committees. Also introduced on both sides and referred to the same committees are bills to establish Glen Canyon Recreation Area in Arizona (HR 8214 and S 27). The Senate Parks & Recreation Subcommittee heard hearings on S 27 on June 3.

Congressman John Saylor has introduced a bill to provide for the development of federally owned minerals (HR 7489) and specifically to terminate and direct the Secretary of the Interior to take action on certain leases pursuant to the Outer Continental Shelf Lands Act in the Santa Barbara Channel. This legislation was referred to the House Interior & Insular

Affairs Committee. Senator Bob Packwood introduced a bill (S 1783) relating to the disposition of mineral resources in wilderness areas and another (S 1784) relating to mineral resources in lands comprising the Three Sisters Wilderness in Oregon. His bills were referred to the Senate Interior & Insular Affairs Committee.

A bill to establish the Buffalo National River in Arkansas (HR 8382) was referred to the House Interior & Insular Affairs Committee. The Senate committee already had had a bill introduced by Senator J. W. Fulbright (S 7) referred to it.

Two bills that could change the Land and Water Conservation Fund from purely outdoor recreational projects to include indoor projects like swimming pools for urban recreational projects have been introduced. The House Subcommittee on National Parks & Recreation had held hearings on these bills (HR 5599 and HR 6581).

A bill by Congressman Saylor (HR 5060) reintroduced his bill of last year to prohibit the shooting of endangered species of wildlife from an aircraft. It has been referred to the House Merchant Marine & Fisheries Committee.

Continued from page 2

seldom great; high ability in mathematics and scientific insight were demanded. A calling was essential; a calling toward the stars.

But the young may no longer be hearing the call. Every year the number of candidates for degrees in astronomy has been declining. Space explorations, machines to visit the moon and the planets, the fascinations of the computer, the joys of remote control, all these may be luring the student away; and the financial rewards for work in space and defense, for universities, faculties, and students as well, may have been greater than astronomy could offer.

A soundly based shift has occurred from optical astronomy to radio astronomy. The newer science will reinforce the old. But men who have watched the stars through the visual telescopes throughout long nights of quiet and patient observation, or who have set the photographic plates in place and seen the legendary images emerge from developing, and have undertaken to interpret them and record them in the growing body of human knowledge of things celestial, have known experiences which the computers cannot offer.

Within the last decade the consumption of electric power in the United States has rocketed. We have been burrowing underground like moles in fear of the hydrogen bomb, which cannot be escaped in that manner, and digging underground to make parking stalls for our sacred automobiles. The basements of our new city buildings deepen to sub-basements, and to sub-sub-basements. They must be air-conditioned, and they must be brilliantly lighted, all around the clock.

We have shut ourselves off from the outdoor world. We build glass homes and offices and then hang blinds and curtains against the daylight. Having closed out the light from the windows, we now build quite often without windows at all. We retreat to rooms in the interior, without natural light. Light from the power plants we burn extravagantly; within short decades we consume the fossil fuels prepared through eons; we waste the most available uranium ores, threatening the promise of atomic energy.

Having shut out the daylight, we exclude the natural currents of air, the normal ventilation of our homes, factories, and offices. We have locked ourselves into an urban planning system and a new architectural design which compel a fantastic consumption of energy. The fumes from the factories, power plants, traffic, summing to general air-pollution, merge with glare-pollution to obliterate the heavens.

These follies, of course, are not inevitable. We may shake ourselves free of the more egregious of them whenever we choose. Let the regulatory commissions try gearing the intangible environmental costs into the electric power rate structures; buildings without windows, buildings hermetically sealed, airless and lightless holes in the ground, for all of these the rates should be doubled, trebled. Rate schedules in general should be inverted, with big users paying higher rates as use increases. Power consumption which results in the glare-pollution of the earth and the skies can and should be made to pay in proportion to the damage done, and can and should be stopped.

Zoning and the revision of power rates could restrain construction based on wasteful artificial lighting and ventilation. Patterns of parking and transportation can be changed to reduce both glare and traffic in favor of people whenever the cities desire. To the extent that the present day megalopolis, which chokes off all natural conditions for life, is a result of the population explosion, solutions, though they should be undertaken promptly, looking toward population stabilization, will take much longer.

But the essential solutions will not be attempted until the value-structures of society are drastically revised. Our judgments of good and evil guide our lives; specifically, while we idealize and idolize glare, we shall denigrate both light and darkness.

Darkness will have a favored place in any civilized scheme of values. Darkness should be restored to our cities; not beyond the requirements of reasonable safety and convenience, of course, but for quietude, beauty, mystery, essential elements in the human sense of relatedness toward self, nature, cosmos. Darkness should be restored to the countryside; in a newly rural society, darkness at night will be a mercy; in the open, under the stars, or watching a full moon rising, a person may be ample again, as in times gone by, after the clatter of the day.

—Anthony Wayne Smith