part consists of faith rather than firm conviction. What the country spends on lipstick or rocketry has almost nothing to do with what the Congress is willing to spend to underwrite the curiosity of the basic-research community. The very nature of basic research makes it difficult to promise anything more than the probability of a payoff, but this perhaps makes it all the more important to demonstrate that this uncertain process will at least be conducted with prudent concern for the taxpayers' money. The Mohole business is a very sorry episode, and it isn't made any cherrier by all sorts of imaginative afterthoughts as to why the taxpayers will benefit from what is fundamentally a very costly effort to answer a question that, although of major scientific importance, is actually of interest to a relatively small number of people. Clearly, there are cheaper and faster ways to develop oil drilling technology than by building the Mohole platform, but the supporters of the project now argue as though black gold from the ocean's depths is a major justification for the project. And when a witness told the Senators that one dividend of the platform would be the ability to measure how much rainfall there is in the ocean, he was probably quite fortunate to get back nothing more than Allott's incredulous inquiry, "You are not going to run a $45-million platform around the ocean to discover that?"

—D. S. GREENBERG

Wilderness Act: Great Smoky Plan Debated

Some conservationists, noting the efforts of the National Park Service to accommodate the swarms of visitors attracted to the national parks, have been afraid that the service may become engrossed in a numbers game—measuring its success more by the number of visitors who pass through the park gates than by the quality of its stewardship as a protector of natural areas and wildlife. This fear accounted in part for the eagerness of most conservation groups to have the Wilderness Act of 1964 apply to the national parks, which historically have had wilderness protection as an important part of their mission, as well as to the national forests, which are made up primarily of multiple-use areas valued as much for their timber harvests as for their conservation and recreation potential. It is still much too early to judge whether or not the Wilderness Act will in fact provide greater protection for the parks. But one can predict that, because of the act, the Park Service will be pressed as never before to perfect and defend its management planning and philosophy.

In a sense, that philosophy and that planning were on trial at recent hearings on the Park Service's wilderness area proposals for Great Smoky Mountains National Park. The hearings, held 13 and 15 June at Gatlinburg, Tennessee, and Bryson City, North Carolina, on opposite sides of the park, placed in bold relief the conflicting demands that play upon the Park Service. With a few local exceptions, conservation groups were strongly opposed to the Park Service plan, which would place 247,000 acres of the 512,000-acre park in six different "wilderness" areas and have a new transmountain road cross the west end of the park through a wide corridor separating three of the areas. The conservationists supported the plan advanced by the Smoky Mountains Hiking Club, of Knoxville, Tennessee, which would reserve 350,000 acres as wilderness and forbid construction of any new public roads in the park's backcountry. On the other hand, spokesmen for local and state governments and business interests supported the Park Service plan enthusiastically.

Witnesses opposing this plan sometimes spoke sourly of local business and political leaders as people who, for a dollar, would surrender Great Smoky to rushing, mindless hordes of motoring tourists. "Simplicity is a vice only to those who would peddle something expensive to replace it," said one. Proponents of the Park Service plan sometimes let it slip that they regard the conservationists as selfish zealots. "Surely the 95 percent have a right to enjoy that which the five percent would keep locked up," said one. "It reminds me of one religious group petitioning the Lord to keep all the others out of heaven."

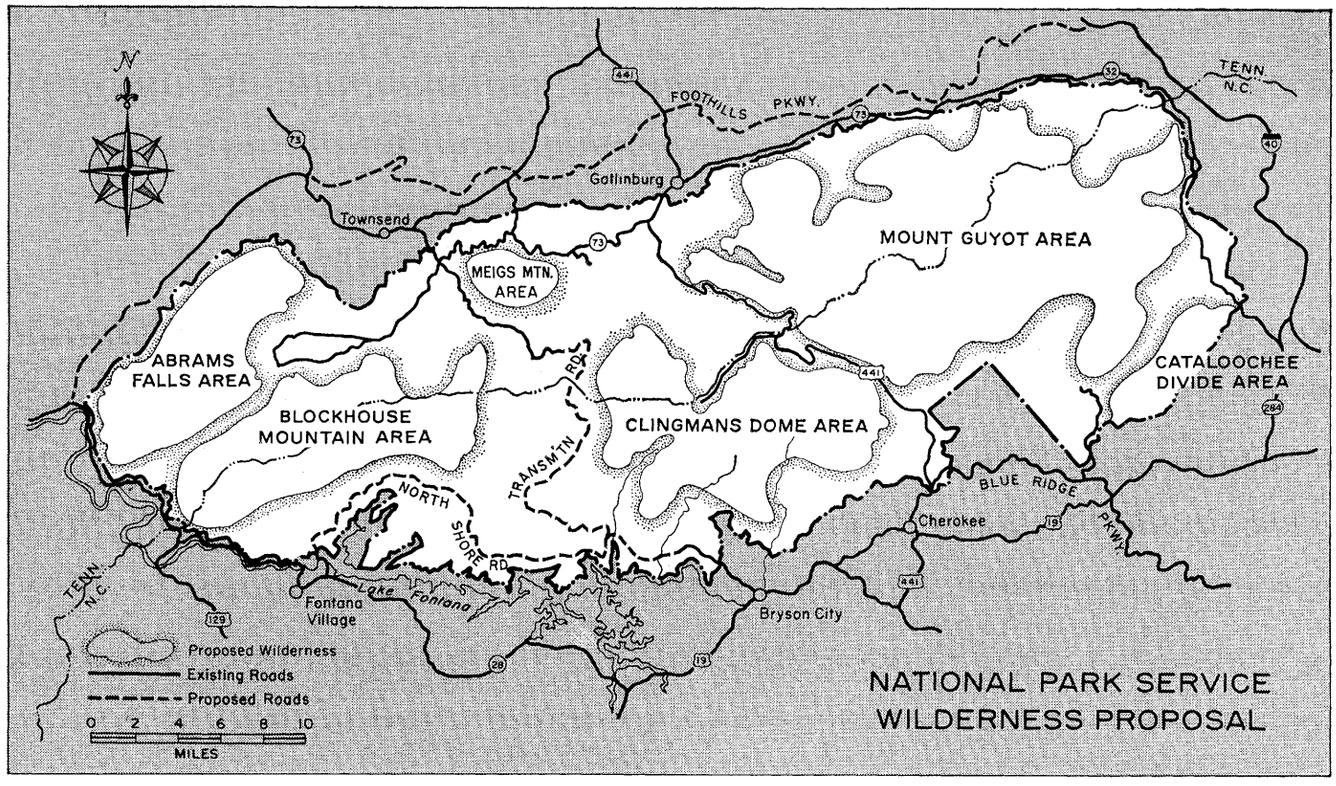
In seeking to reconcile the competing claims of the conservationists and those who would open up Great Smoky and other parks to heavier public visitation, the Park Service is at times hiking along trails which lead it knows not whither. Competent observers within the Park Service and the Department of Interior concede that the Service never has built up the scientific research capability which would enable it to foresee more clearly the consequences of important management decisions affecting the parks.

This is well illustrated by the Service's master plan for Great Smoky, which includes the proposed transmountain road as a dominant feature. Investigation of the ecology of the area to be traversed by the road is far from complete, and just what the road's effects would be no one really knows.

The Park Service has emphasized that the government, by a 1943 agreement with local and state authorities in North Carolina, committed itself to build a road around the north shore of Fontana Lake in exchange for a road that was to be flooded by the waters impounded by TVA's Fontana Dam. The transmountain road has been proposed by the Service as an alternative to the lake shore road, which, by slashing across ridges, would require a number of destructive cuts and fills.

According to the Park Service, the transmountain road, by following natural contours along most of its route, would "avoid undue damage to superlative park values" and alleviate severe traffic congestion on highway 441, the existing transmountain road that was built before the national park was established. State and local officials have accepted the Park Service proposal, which still awaits the approval of Secretary of the Interior Stewart L. Udall.

Although some conservationists agree that it would be better to construct the transmountain road than the north shore road, most are as hostile to one as to the other. Indeed, the Park Serv-



ice is yet to produce findings by highly qualified professional ecologists that the transmountain road can be built without—to use the Service's phrase—"undue damage."

In fact, ten or more university and laboratory scientists who visited Great Smoky for 6 days in May to prepare a research plan for the park are reported to have felt, to a man, that no road should be built. Conceivably, if the Park Service had received such advice from qualified researchers of its own when the transmountain road was first being considered a few years ago, the Service might have pressed the North Carolina officials to agree to having the government discharge its obligation by building a road or other facilities outside the park.

The outcome of the Great Smoky wilderness proposal is deemed by conservationists to be of special significance because the proposal is the first to be presented by the Park Service for public examination and criticism. The Wilderness Society, in a bulletin to its members in May, said that the June hearings on the Great Smoky plan would shape "procedures, precedents, and official attitudes" influencing how much wilderness will be preserved in Great Smoky and other national parks.

The Wilderness Act gave immediate statutory protection to about 9 million acres of national forest land which had been administratively designated wilderness or wild areas. An additional 52.1 million acres of public land, managed by the Forest Service, the Bureau of Sports Fisheries and Wildlife, and the National Park Service, were to be reviewed to determine which parts are suitable for inclusion in the wilderness system.

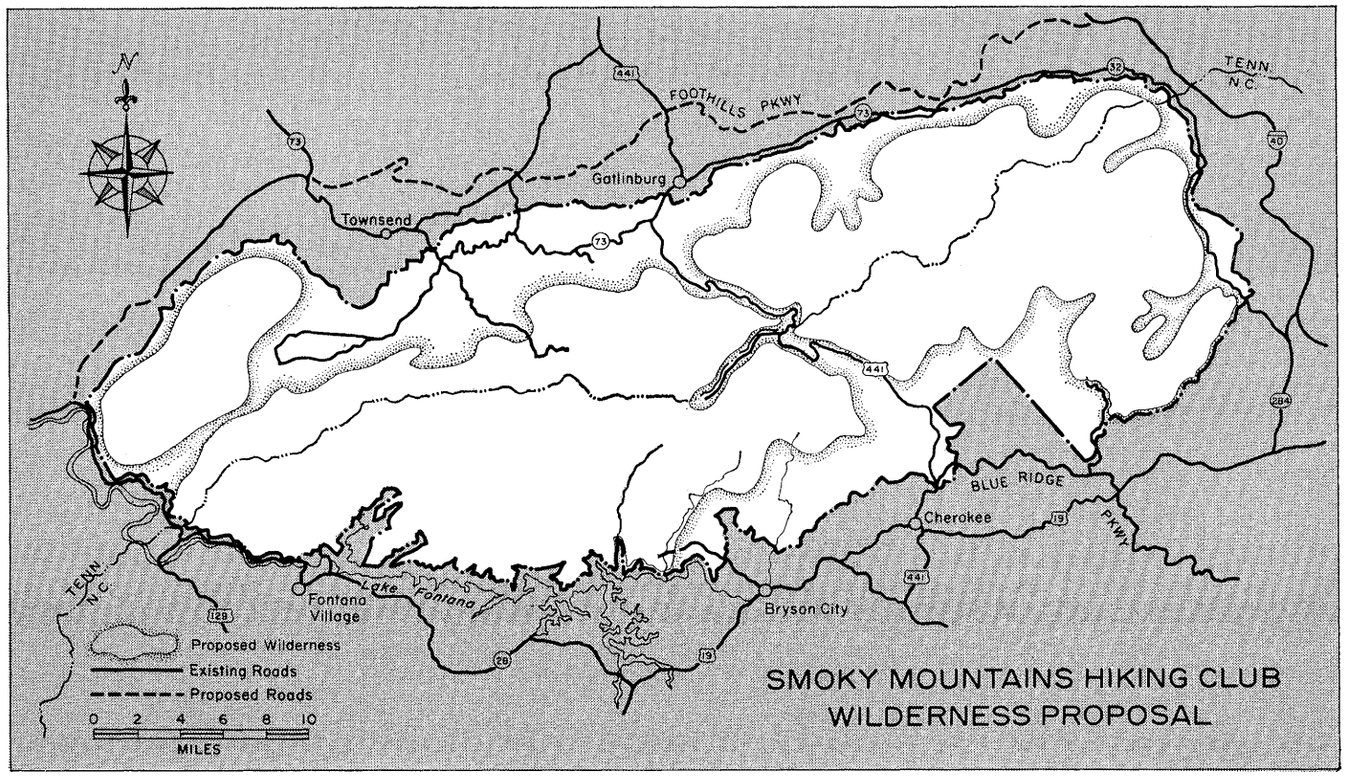
The act directed the President to submit to Congress, over a 10-year period, his recommendations on the areas eligible for review, with recommendations on at least a third of the areas due by 3 September 1967. The President's recommendations will not take effect without affirmative action by Congress. Inclusion of an area in the wilderness system protects it, in most instances, from exploitation or the development of roads and other man-made facilities.

The holding of public hearings on the Park Service's Great Smoky plan was a step toward the formulation of the President's initial wilderness recommendations. The Park Service and the Secretary of the Interior will consider the record of the hearings with a view to possibly making changes in the wilderness plan before adopting it as part of the recommendation to be prepared for the President. Altogether the Park Service has nearly 23 million acres of land in its parks and national monuments, though much of this acreage is not wilderness.

Not everyone believes that it was necessary, or even desirable, to have the Wilderness Act apply to the Park Service. The act of 1916 creating the Park Service declared that the Service shall "conserve the scenery and the natural and historic objects and the wildlife therein [of the parks and monuments] and . . . provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." To some people, including many in the Park Service, this language seems to put as much stress on public enjoyment of the parks as it does on the protection of park wilderness. But Anthony W. Smith, president of the National Parks Association, a private conservation group, interprets the act to mean that the national parks should be administered with a primary concern for wilderness preservation.

Accordingly, Smith urged that the Park Service be excluded from the wilderness bill when it was being considered by the House Interior Committee in 1964. "The risks inherent in this effort to provide secondary or supplemental statutory protection for wilderness in the parks are greater than the advantages to be gained," Smith said.

He observed that the national parks



live under the threat of legislative proposals to permit developments and activities such as road and dam building, excessive expansion of recreation facilities, and logging, mining, and motorboating. "In many cases a variety of such legislative proposals lie dormant," he added. "As soon as a new wilderness bill relating to parks and monuments is proposed, all these sleeping dogs around the various parks will awaken," Smith said. His apprehensions were shared by some Park Service officials, but Secretary Udall, accepting the view of most conservation groups that the park wilderness needs further protection, favored bringing the Service under the wilderness bill.

Taking the Great Smoky wilderness issue as an example, one can find arguments to support either of the two conflicting points of view. Because of the Wilderness Act, conservationists are getting a chance to criticize the Park Service's plans for Great Smoky and to offer counterproposals. Without the act, road projects or plans for other developments—such as the proposal to build a lodge for hikers and horseback riders at or near Spence Field, a grassy bald on the Smokies' crest—might be far advanced before the public ever learned of them.

Nevertheless, the Wilderness Act has afforded the state and local interests that want the transmountain road some new tactical possibilities. If Secretary Udall decides that the road should not be built, the matter will not end there unless Udall offers a compellingly attractive alternative.

At the Great Smoky hearings, Representative Roy A. Taylor, congressman from western North Carolina, said, "Congress will never approve legislation that would lock this park up so as to preclude all future road building and development. Congressmen are not going to vote to put a stop to progress." Taylor may not have been talking idly. He is a member of the House Interior Committee, which has jurisdiction over wilderness legislation, and congressional committees are often obliging in helping a member with a problem in his home district.

Moreover, Representative Wayne N. Aspinall of Colorado, chairman of the Interior Committee, is by no means an uncompromising defender of wilderness. For example, he sided with those who sought unsuccessfully to have the Wilderness Act permit construction of a ski lift in California's San Gorgonio Wild Area.

In future controversies over proposed roads, dams, or other developments the Park Service is likely to find local interests often opposing its wilderness plans instead of supporting them as at Great Smoky. The Service could put up a stronger defense of its proposals if, on the basis of competent scientific findings, it could explain why certain plant and animal communities will be threatened if the wilderness ecology is disturbed. In any event, the Service's management philosophy may turn out to consist of nothing more than incompatible slogans unless, by supporting its planning with a greatly expanded program of research in natural history, it discovers ways for more people to enjoy the parks without sacrifice of the parks' natural values.

A 1963 report by a National Academy of Sciences committee said, "It is inconceivable that property so unique and valuable as the national parks, used by such a large number of people, and regarded internationally as one of the finest examples of our national spirit should not be provided adequately with competent research scientists in natural history as elementary insurance for the preservation and best use of the parks."

The committee expressed shock that in 1962 the natural history research staff numbered only ten people. It wryly observed that this staff's research budget of $28,000 was roughly equivalent to the cost of one campground comfort station. Today the Service's natural sciences research staff still consists of ten people; the staff's research

budget has increased several fold but, in relation to the prevailing need, the increases have been considered slight. Those who would expand the research effort have had to struggle against the traditional attitude of Congress and of the Park Service itself that the Service is not an agency with major research requirements. Some research is carried on in the parks by scientists whose work is not supported by the Park Service, but such research cannot be directed to park management problems.

The park naturalists once played an important research role, but in recent years their time has been increasingly taken up by administrative duties and the shepherding of park visitors. According to qualified observers, the job of park naturalist has lost most of its appeal for men with an urge to do scientific research.

The NAS committee reported that, because of the lack of research, the Park Service has made a number of mistakes in planning. The construction of a new road and parking area in Yellowstone Park contributed to the dormancy of the Daisy Geyser, it said. Among other examples cited was a water system project in Mount McKinley Park which entailed cutting a 50-foot swath through virgin forest for more than a mile. This scar on the wilderness proved useless for the purpose intended.

One member of the NAS committee was Stanley A. Cain, an ecologist who was then chairman of the University of Michigan's Department of Conservation and who is now Assistant Secretary of the Interior for fish, wildlife, and parks. Cain is still deeply concerned by the inadequacy of the Park Service's research program. In his view, one of the few encouraging developments of recent years has been the start made in preparing research plans for the parks. This program was begun by George Sprugel, an environmental biologist brought over from NSF to head the Park Service's natural science research. So far only the research plan for Isle Royale Park in Lake Superior has been completed, but plans for seven other parks, including Great Smoky, are in preparation. University scientists, such as the biologists and ecologists from Duke and the University of Tennessee who visited Great Smoky in May, are taking a major part in this work. A central question that will have to be posed in the research plans for most parks is, How large must the wilderness tracts be if a wilderness ecology is to be maintained?

The Great Smoky master plan containing the controversial road was substantially completed in 1964, nearly 2 years before development of a research plan was begun. The team that developed the master plan consisted of a Park Service superintendent, a retired Service official, a design engineer, a state parks director, and a former Park Service naturalist and geologist who now heads the Service's overall research program as assistant director for resource studies. No professional biologist or ecologist with extensive research experience in the ecology of the Great Smokies took part in the preparation of the master plan.

In defending the plan, the Park Service has noted that, for much of its route, the transmountain road would go through an area which was cut and burned over before it achieved park status. The Canadian spruce-fir forest for which the Smokies are famous does not extend into the area to be crossed by the road. However, an area need not be covered by virgin forest to be classified as wilderness, and conservationists have noted that the once-abused areas of pre-park days have made a remarkable recovery.

While many conservationists would concede that the Park Service has done a generally good job of protecting the park to date, they fear that construction of a road across the park's west end inevitably would be followed by the construction of spur roads, camp grounds, and other facilities which would subject this area to intensive public use. Moreover, they insist that the ever-increasing tourist traffic—the park had nearly 6 million visitors last year—would clog the new transmountain road just as it has clogged the existing road. Conservationists feel that the park should be viewed in context as a part of the overall Southern Appalachian and Blue Ridge Mountains system—much of which does have scenic drives for motorists. For example, motorists soon will be able to take the Blue Ridge Parkway all the way from Great Smoky to the north end of Shenandoah National Park in Virginia, for a distance of 574 miles.

Radical solutions to Great Smoky's traffic problem, such as banning cars from the park and inaugurating a bus system, have been proposed by conservationists, but Park Service officials give no indication they will seek such solutions until a crisis demands them.

The NAS committee found the Park Service management philosophy confused 3 years ago. To judge from the Service's Great Smoky master plan, that philosophy is no clearer today. Of all that conservationists might wish from the Wilderness Act, perhaps nothing could be of greater importance than its potential for shaking complacency. Pressures are being generated which ultimately may force the Park Service and its departmental overlord, Secretary Udall, to establish clear and compatible Park Service objectives and to pursue them through an adequate program of research and planning.

—LUTHER J. CARTER

Announcements

The Pacific Science Center, Seattle, recently opened its regional **Mathematics Learning Center** for the Pacific Northwest. The facility, available both to the public and school groups, includes a classroom, reference library, film library and preview room, and a large section of exhibits demonstrating various mathematics principles and theories. The center was made possible through grants from the Carnegie Corporation of New York and the Alfred P. Sloan Foundation; the exhibits are sponsored by IBM Corporation.

Columbia University is accepting nominations for a new award for **basic research in biology or biochemistry**. A prize of about $20,000 will be given annually to an individual or a group of investigators for outstanding contributions; preference will be shown for work done in the recent past. Nomination forms and additional information are available from John V. Taggart, Columbia University College of Physicians and Surgeons, 630 West 168 Street, New York 10032. Deadline: *1 October*. The prize, named for Louisa Gross Horwitz, was made possible under the terms of the will left by her son, S. G. Horwitz.

The National Science Foundation will give about $16.5 million in grants over the next 3 years to strengthen the research and education programs at five universities. The grants are the most recent to be made in NSF's **science development** program, which was begun last year as part of an effort to increase the number of first-