

**man &
nature
in the National Parks**

Reflections on Policy

F. FRASER DARLING

NOEL D. EICHHORN

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Preface

This is a report on an inquiry conducted by F. Fraser Darling, vice president of the Foundation, and Noel D. Eichhorn, an associate of the Foundation, into some of the social-political-ecological problems of the national parks of the United States.

The study was made possible by a generous grant from the Old Dominion Foundation, for which The Conservation Foundation is grateful.

While the study and the resulting report were delayed by three serious illnesses, the authors' findings are pertinent to the continuing dialogue in and out of government on the use, protection and extension of the National Park System.

Fraser Darling, an ecologist, and Eichhorn, a geographer, examined the impact of man on the national parks. Their conclusion: the national parks now face dangers from within, in addition to the older and more generally recognized external pressures for economic exploitation of the parks' timber and mineral resources. These new dangers come from increasing number and densities of people, spending more of their increasing leisure time in the parks, bringing more of their automobiles and accompanying paraphernalia into the parks.

National parks can mean different things to different men, as Fraser Darling and Eichhorn note. But if the priceless values of the parks are to be enjoyed and sustained today, tomorrow, and for posterity, man would

do well to heed their warnings and recommendations on National Park Service policy and administration. Fraser Darling and Eichhorn hasten to point out that the Service is already implementing some of the recommendations offered by two official committees which reported earlier. This is heartening.

But more remains to be done — for the parks and people of this nation, and for another reason. Conceived in the United States, the national park concept is “an inspiration to the rest of the world,” as Fraser Darling and Eichhorn observe. Other nations draw upon the National Park Service for policies, programs, and training. Thus for our own sake in the United States and for others drawing upon our example, it is essential that the very highest national park standards be established and maintained.

In the summer of 1967, William H. Eddy, Jr., of our staff, assisted by Leonard Godfrey, began a new Foundation project, under contract with the National Park Service, to investigate new horizons in interpretative programs in the national parks. Because of its pertinence to the Fraser Darling-Eichhorn study, Eddy’s preliminary report on his experiences in four national parks during the summer is included in the publication as a postscript.

RUSSELL E. TRAIN, *President*
The Conservation Foundation
December 1967

Early in 1969 it became apparent that a new printing of this report would be required to meet requests for it. Frank Fraser Darling and William H. Eddy, Jr. were asked for their observations since publication of the first edition in 1967. Fraser Darling has supplied a new foreword, which appears before the original introduction, and Eddy has written a new postscript, which closes this second edition. It is encouraging to note that each, independently, reports improvement and progress.

SYDNEY HOWE, *Acting President*
May 1969

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Foreword to Second Edition

Three years have passed since this report was written and nearly two years since its publication. It is inevitable that there should have been change in that time and that national park policy should have bent itself to the problems of the day, some of which were outlined in this essay.

I do not believe that the criticisms we voiced of national park policy were anything new to or unappreciated by the National Park Service, and it would be unwarrantably immodest to suggest that such changes that have been made in line with our criticisms and recommendations were the result of our travels and report. Rather do I think that such thoughts as we crystallized were already in the minds of individuals of the National Park Service and were ready to be expressed by the Service as a body. Perhaps we helped a little to ease the periodical ecdysis which every public service must undergo, and to which the National Park Service was already developing. The urge was there.

Political climate is a hazard all governmental agencies have to face. Sideline observers like ourselves can advise with pontifical detachment that which we imagine to be ideal. The National Park Service has to do the job, coping with congressional frosts and the inexorable rising curve of tourist visitation. It is my opinion that the Service has achieved a fine record of advance in the short time since we wrote and published.

Biological research in the parks has been much encouraged, both by

outside collaborators, such as the universities, and also by the creation of new posts of senior biologists within the Service. This has resulted in a surge of enthusiasm in a section of the Service where hope was dying. Master plans are showing a marked ecological content.

I would go so far as to say that increased ecological participation, inside and outside the Service, has provided some of the ineluctable proof a hesitant administration needed to firm-up its policy. My impression is that direction today is much more decisive and well fortified than heretofore, especially in those fields most closely concerned with the preservation of park values. The original directives of over half a century ago were made in a different world from ours: half a million visitors to the entire system have become a hundred and fifty million, i.e., three hundred times as many. The magnitude of the task of management is frightening, not only on the side of conserving the parks, but in the growing awareness of what the national park system means in the maintenance of human environmental well-being.

The number of properties in the system increases and individual properties are being enlarged, not just for the sake of making them bigger but for wise reasons of ecological diversity and the ecological co-operation which can exist between one habitat and another. It is one of the handicaps of democratic government that what needs to be quite rapid and agile action in some situation tends to be slow, ponderous and perhaps so late as to be ineffective. Purchase of potentially damaging inholdings and of ecologically necessary enlargements was subject particularly to suffer from lack of a rolling fund.

It was with pleasure and gratitude that the announcement was received, shortly after publication of this essay, of the creation of the National Parks Foundation under Public Law 90-209, as a non-profit, charitable, tax-exempt corporation. The chairman was to be the Secretary of the Interior, with the director of the National Park Service as secretary. The new foundation succeeded to the assets of the former National Parks Trust Fund Board, but the new powers of the foundation to acquire property for the benefit of or in connection with the National Park Service drew forth immediate response. The establishment of the foundation makes easier the intentions of such bodies as the Nature Conservancy to acquire land and give it to the national parks.

One splendid example of this co-operative action has been the enlargement of Haleakala National Park on Maui, Hawaii, by donation of 4,300 acres on the east side of Haleakala, the Kipahulu Valley. In contrast to the relative aridity of the great crater itself, the Kipahulu Valley adjoining has a very high rainfall of around 300 inches a year. Its dense vegetational condition is to all intents and purposes the same as before

the islands were discovered by Europeans. The tract is an invaluable addition scientifically to the national heritage.

This gift originated in an offer by Laurance Rockefeller to give his holdings in the area if the rest could be acquired. The Nature Conservancy's action followed and, lastly, showing the snowball effect of spontaneous, yet constructive giving, the state of Hawaii has offered to give 5,200 acres of its own adjoining forest land to the park.

As a bare statement to supplement this spectacular acquisition, it should be mentioned that in the four-year period 1965-68, the lands division of the National Parks Service acquired 78 inholdings to the total of 586,224 acres, and 1,282,176 acres of new areas added to the system. This is magnificent work.

In conclusion, I would add that in the years since our survey began in October 1962, the environmental crisis has grown and the significance of the national parks has increased as an environmental factor in the nation. The director of the Service, George B. Hartzog, Jr., has made some characteristic, energetic and shrewd statements on the situation. He says:

"Our national parks are comparable to the canary in the miner's cap; a stilled voice signaling the presence of death in the mine shaft air. Parks are our early warning system. The pressures on them are the same pressures that threaten our overall environment. . . . How much are we willing to lose? How far down the quality scale will we slide before we decide?"

The National Park Service is under pressure, but I for one have faith in it, insofar as it has power to act. Certainly it must keep its ear close to the ground to hear about such developments as the projected jet-port adjoining the Everglades and the access highway through the park, before the wretched scheme becomes as good as a *fait accompli*. As George Hartzog says:

"The silence of the canary grows deafening."

F. FRASER DARLING
May 1969



Introduction

We start from the point of view that the national park idea is a major and unique contribution to world culture by the United States. The idea has now been in practice for nearly a century from the time when 3,400 square miles of high country in Wyoming were designated as Yellowstone National Park. Its origins lie within the Romantic Movement and it is a later manifestation of the spirit of equality and brotherhood of the American and French Revolutions. The reawakening of the awareness of nature so evident in the writings of Rousseau and in the poems of Wordsworth and Coleridge was expressed for Americans by Emerson, Thoreau and Bryant with a typical desire to weave it into the stuff of life in a country of opportunity.

The carrying of the national park idea into fruition in the United States has continued to be an inspiration to the rest of the world. The idea has also borne fruit in other parts, particularly in Africa, but the parentage is never forgotten, and the National Park System and the National Park Service of the United States are looked up to in a very special way. The sanctity of the parks, the careful blending of architecture, the ways of doing things to give animals and plants and scenery their foremost places: all this is appreciated abroad as well as at home.

The early history of the national park movement was one of idealism and solid propaganda effort. Roads were begged as a means of get-

ting people into the areas to gain support for the idea. Certain animals were protected even to the extent of reducing the numbers of natural predators. Large hotels in pleasant rustic style were built near the major scenic attractions. In addition to appreciation of nature, healthful outdoor exercise was encouraged.

Since that earlier time both parks and country have changed. The impacts of the internal combustion engine and the increase of leisure were not clearly foreseen and the National Park System is now suffering physically from the success of public interest expressed as numbers of visitors. As population and productivity have increased, wild country outside the parks has diminished, and the fishing and camping which were once found close to home in abundance are increasingly looked for in the national parks which no longer seem remote.

The initial unselfish and generous gesture of sanctuary and inviolability for animals, coming from an era when wildlife management had not been studied, has later raised problems of conservation of vegetation. The larger numbers of visitors with more modern standards of comfort and more sophisticated ways of amusing themselves have raised other sorts of conservation problems. The pressures of these human and animal populations in the parks have demonstrated the necessity for continuing ecological research and land management evaluation if the areas are to be sustained for posterity. The dangers to the parks from within must be met as surely as attempts by exploiters to log or mine the areas.

The inquiry which this report represents was envisaged in the spring of 1961, at a time when ecological conditions in many national parks were causing concern to those individuals within the U.S. National Park Service sensitive enough to be aware. Members of the Service who talked with The Conservation Foundation made it plain to us that research in depth of a socio-ecological kind was necessary and that guidelines to such research were far from clear.

In some measure the urgencies of 1961 have been relieved by the reorganization which has taken place within the National Park Service and by the reports of two official committees appointed after our work began.

The Leopold Committee* reported early in 1963 with admirable plainness and brevity. The report was reprinted by several outdoor magazines and many thousands of copies were distributed. Its influence on National Park Service policy has been considerable.

* U.S. Department of the Interior Advisory Board on Wildlife Management; A. S. Leopold, chairman. Its report, *Wildlife Management in the National Parks*, was submitted in 1963 and published by the Interior Department in mimeographed form.

The Robbins Committee,** on which one of us had the honor of serving, spent more time and made more detailed inquiry. Its report was disturbing in that it showed the low status of research in the National Park Service despite the obvious need for such work to solve existing problems. The report was critical and widely quoted, but the influence on National Park Service policy seems less marked than that of the Leopold Committee, which also commented on the paucity of research. Many of the Robbins Committee's specific recommendations have been acted upon, however, and a new position of Chief Scientist has been established.

Our survey has been of a more informal kind than is possible for a formal committee and we have cast our net very widely. A national park exists in an intricate complex of political, social, legal, intellectual and sentimental factors. The terrain of a national park cannot be treated as a museum piece to be preserved behind glass. Some things are possible and some are not; compromise is necessary and inevitable, but it would be wise not to follow a policy of expediency. However biological our initial approach may have wished to be, as ecologist and geographer we have faced the larger field, knowing our limitations, and aware that our report must be concerned with policy-making more than with biological detail.

We are grateful to the Department of the Interior and Secretary Udall for constant encouragement and kindness to us in the course of this study; the National Park Service, in the field and in Washington, has been most generously helpful in discussion, making documents available and giving us the time of its representatives in the parks, often at busy periods. Our thanks to the Director and to the members of the Service can never be adequately expressed. If they will take it that way, our plain criticism of certain items in policy and administration are the highest compliment we can pay to what is a *corps elite* in the service of the United States.

** National Academy of Sciences — National Research Council Advisory Committee to the National Park Service on Research; W. J. Robbins, chairman. 1963.



The Nature of a National Park

1

Our first question is both provocative and pragmatic: “What is a national park for?” We have consistently asked this artless question in the course of our travels and have received widely different replies. The question has been put to many members of the National Park Service in Washington and in the field, with equally divergent replies.

We can forgive the fluffiness of the description in the Yellowstone Act of 1872, for the draftsmen were treading where angels have burned their toes, but it says, “a public park or pleasuring-ground for the benefit and enjoyment of the people”, and also that “the natural curiosities or wonders” were to be retained “in their natural condition”.

What is a pleasuring-ground? This phrase is truly archaic, at least 18th century, and given to such London gardens as Vauxhall. Presumably the 19th century Congress passing the act did not see the wilderness of the Yellowstone quite like that, but as the national parks have developed through nearly a century of increasing population, wealth, leisure and mobility, there are certainly people who would like to see some parts of the parks much like a Vauxhall, with the equipment for entertainment and enlargement of concessionaire interest. Hot Springs and Platt are in the nature of pleasuring-grounds and can be probably little else. Development of some of the recently created national seashores may or may not conform to the notion of pleasuring-grounds. Assateague Island in Mary-

land is specifically to include the Jones Beach type of development. We hope this will not extend to Point Reyes on the Pacific seaboard!

We can surely take it as an overall expression of informed and serious opinion in the nation, that people do wish the national parks to be unspoiled by development, and that they do wish the heritage to be preserved "unimpaired", as the acts and official proclamations have it, for posterity. Nevertheless, we must emphasize the difference of types of country involved in the system, the difference in reasons for designation, and the difference of ways of acquisition of the terrain.

Yellowstone was the first and the place which Congress called "pleasuring-ground". It remains as nearly typical as any one park can be of the large virgin western national parks. It is unlikely that many people thought the Yellowstone Act was intended to preserve what is now called wilderness; the area of the park was far better explored than most of the mountainous west and, therefore, less wild. The pleasures of the park were first: curiosities of nature, geysers and hot springs; second: spectacular scenery, the canyon and the falls; and third (perhaps): the abundant wild game and the setting of grasslands, lakes and forests. For most people the order of these remains unchanged, although the "perhaps" has been removed from the third as less and less of wild nature remains outside the parks, and there are some parks, like Isle Royale, which are nearly pure wilderness.

Yellowstone was public domain, not fully explored, and the start of a national park was from scratch: but what of Acadia, Cape Cod and the Virgin Islands? New attitudes of what is a national park are necessary, and to bring the present-day Yellowstone notion or the undisturbed wilderness notion to bear on these three properties would be merely silly. Even Yellowstone is hardly undisturbed wilderness.

Acadia began with a gift of 6,000 acres by local landowners and since has been much increased in size by the munificence of the Rockefeller family. The island was already much changed from any primitive condition. The area had had permanent settlement for 200 years and sporadically by the French long before. Now, in addition to local ways of earning a living from the sea, it is a popular holiday resort with summer homes and yachting anchorages.

Why have people come to Acadia in the past? For a wild coast, woods coming down to the sea, good anchorages and a way of life slower than in the rest of the country. National park intention here, surely, is to restrain development but not stop it; rather to guide it in traditional fashion and prevent unsightly advertising. There is nothing disturbing in essence because the boundaries of such a national park are intricate and rather odd, and private landholdings either in or adjacent to the park

should have no fears of their quiet style being upset. A national park of the Acadia type requires a careful planning or zoning scheme which can be enforced and which can give continuity.

Cape Cod is another example of a long settled area receiving welcome protection in the National Park System. The architecture of the traditional houses is part of the delight and the long-established golf course is a green, well-tended, man-made landscape which is an asset in the total environment of Cape Cod. The work of the National Park Service as a body with power in rehabilitating the sand dunes is beyond praise. If drivers of sand-buggies object to their amusement being curtailed they must remember that the sport of setting light to haystacks has also been curtailed. Here again, the National Park Service intent is care in managing a pleasing, man-made landscape and continuing living place, by means of overall planning.

St. John in the Virgin Islands is an entirely changed landscape from the primitive, but it is still a pleasing one. The Caribbean is becoming a vast holiday ground with soaring real estate prices, a premium on beaches, and all the possibilities of unsightly development. Indeed, spoliation has already gone far with building on tiny lots. The national park will have considerable biological value in allowing recording of the rehabilitative powers of nature, and on the occasion of our visit we were glad to see botanical research in active progress. The park will preserve some beaches from commercial exploitation and prevent the littoral fauna from being impoverished. The Virgin Islands National Park will for many years be primarily an adjunct to a popular holiday area, but this in no way belittles the high educational and natural history value this reservation of land can have. The climate will co-operate with the National Park Service in recreating a Caribbean wilderness through time.

These three newer national park areas are near to being “pleasuring-grounds” in a style of decorum and sense of preserving for future generations. But “unimpaired” is not the word to be used in managing them. There will be development and change within the range of what these parks represent. Portions of Acadia and Virgin Islands will certainly be restored to nearly as close an approximation of the pristine state as can be found in Yellowstone, but to lose the existing integration with the neighboring human communities in accomplishing this would be tragic.

Our feeling in discussing the problems of these areas with people inside and outside the National Park Service is that opinion has scarcely become flexible enough as yet to accept them as pointers of change in national park conception. To treat them in the arduously learned discipline of the wilder parks would lead to frustration and possible disaster.

We shall deal later with the misfortune the National Park System suf-

fers from having no adequate planning or zoning legislation governing the type of development of areas adjacent to the parks. Sometimes, the United States Forest Service marches with a national park and the result is as near perfection as could be hoped, but there are Gatlinburgs, Cherokees, Estes Parks and White's Cities, which show that some people visiting national parks desire some of the amusements reminiscent of Coney Island; and others, not expecting these, will nevertheless use them on a wet day. Enjoyment of a pleasuring-ground can be interpreted anywhere between the extremes of walking alone in deep wilderness and rubbing shoulders with others on a beach. Is national park enjoyment to compass this span entirely? We have had uncritical and philanthropically-intended answers that it should, although most answers have piously included the proviso that the provision for enjoyment should be such that the national parks are "maintained in absolutely unimpaired form for the use of future generations".

We can neglect that small, uncritical, overgenerous section of opinion that would include Jones Beaches, but would point quite plainly to the fact that we have found no uniformity of interpretation of what a national park can be within the administration of the National Park Service itself. Whatever the pattern, a fabric must have a warp fiber.

We have heard so often the remarks, "Parks are for people" and "It is no good having beautiful areas if the public cannot get into them and see them". Uncritical acceptance of the implications of these remarks would push aside the welfare of the biological communities represented in the parks, reduce scenery to the bare physiography and its interplay with the climate, and deny continuing existence of truly remote places. Further, in a time when the population is expected to increase considerably, along with leisure time and technical ability in moving over remote country, we are bound to ask whether the parks are to be considered as expendable assets, and what kind of enjoyment of national parks will be available for posterity. It is our belief that many people "enjoy" the parks although they do not visit them. The very fact that such preserved areas exist is a matter of immense satisfaction to people who take the view that nature exists in her own right and that it is the duty of reflective man, with his dominance over the planet, to conserve the areas represented by national parks for the reasons they were chosen for that dignity.

Our own definition of legitimate enjoyment of national parks would be that it should be of that order which places first the ecological well-being of those areas in relation to their perpetuation as natural biological communities and expanses of natural scenery. The question should be asked: "What is *this* national park for?" This does not preclude development but it limits it to that which is appropriate and calls for individual consideration of every situation where development is contemplated.



For example: we were impressed with the improvement in, and rehabilitation of, the natural biological community covering the potentially beautiful physiographic skeleton of the Blue Ridge Mountains represented by Shenandoah National Park. The Skyline Drive is a beautifully planned highway and a model for other nations. The transient settler population has gone and because of favorable temperatures and kindly rainfall, the hardwood forest is regenerating fast. This power of rapid regeneration makes possible a degree of development in a much-visited area which a more fragile biological community would or should preclude. The overlooks at frequent intervals, which have been cut out along the highway, are dramatically beautiful and give pleasurable surprise to a drive through the regenerated forest; there is little fear that such developments will injure anything which the park represents. The greatest danger in Shenandoah is the possible extent to which the National Park Service is ready to provide campsites. And this applies in many other parks; campsites take space, they involve the accretion of large quantities of organic matter and arrangements for disposal, the provision of water supply and of drainage. Can the biological communities take increasingly such treatment and remain unimpaired?

The example of opposite conditions to Shenandoah might be Chaco Canyon in New Mexico where, in a dry and rather harsh climate of heat and cold, many important pueblo constructions are being carefully investigated and preserved. Continuing bad land use outside the area has resulted in rapid change in the river valley and much of archaeological interest has been lost. Visitation in 1962 was about 20,000 and access to the site along 30 miles of dirt road. A good black-top road has now been built into the Canyon and the number of visitors has nearly doubled. In the near future visitation will be high enough to make further development necessary. The question should be whether ways can be found to allow a small number of interested visitors to examine the pueblos as they did in the past. The fragile nature of these ruins would make it necessary to guide the visitors past the ruins rather than allow them in, were the number of people to increase much further. A similar situation is developing at Mesa Verde, where a finely engineered road through very rough country allows access from the highway in about 30 minutes. The number of visitors is increasing to such an extent that before long the public will see the mesa dwellings only from across the canyon. Sheer numbers and the time it takes to pass people along, and the very fragile nature of these intensely interesting ruins, will soon preclude intimate experience, although we would admit that the sight of one of the pueblos from across the canyon when the sun is on it can be a most satisfying and moving experience.

The most upsetting example of dichotomy of thought of what a national park should be is the Everglades. Here is a wilderness type of park with some scarcely comparable developments on the fringe, which might be acceptable were it not that they act directly against maintenance of the conditions which prompted acquisition and designation of the park. The essential nature of the Everglades is the seasonal passage of water over an almost flat but in fact gently southward-sloping area of porous Miami Oolite. A large amount of the water which would flow slowly over the 40 miles of the Everglades to the Gulf is now deflected. The greater part of the lost water pours into the Atlantic and the Gulf of Mexico. Drainage is the villain far more than irrigation. To complicate matters the drained land has subsided. A good deal of research of fine quality has been done on the geology and hydrology to find means to augment the flow over the park; in short, an earnest attempt has been made to learn how to preserve the ecosystem of the Everglades. Nevertheless, for the recreational use of the small boat using community, a hole has in effect been punched in the bottom of the Everglades by dredging the canal from Flamingo into the swamps. Water flows away faster than it has to, and the impeding vegetation which might naturally have slowed the leak is cleared for the benefit of small craft penetrating deep into the ecosystem of the swamps. Salt water also penetrates. Other means of access, slightly less convenient, could have been provided, or, at the least, a lock might have been installed to keep fresh water in and salt water out.

As we see it, the dichotomy of the conceptual approach is typified here. Is the Everglades a park chosen for its wilderness and remarkable wildlife, or is it a recreation area or pleasuring-ground?



The National Park Resource



There is, in the histories of communities in relation to their resource base, a period of learning how to reach the resource and use it, followed by a period of rich enjoyment which seems endless in that happy time; then there comes a choice of working out the resource and losing it, or learning the art and science of conservation that the resource may be perpetuated by wise use. The forest estate of the United States passed through the stages of being a menace to be pushed back, a resource to be used without thought, and finally an estate to be cared for under a body so eminent and able as the United States Forest Service. It is fully realized that there is some blessed, happy moment when the population and the resource are in some momentary balance of usefulness, enjoyment and ecological repose. Unfortunately, the moment of our human enlightenment comes later than the moment of optimum and in the whole story of conservation we are stopping gaps and trying to repair the damage we have allowed to occur. In mentioning the forest estate we have used an example where the resource is finite at any one time, the measure being board-feet and the variables being climate, water supply and fire. These variables are studied intensively to build up a corpus of knowledge of forest management.

The national park estate is finite in acreage, but the resource of national pride, enjoyment and usefulness in the life of the people cannot be set down as board-feet. It is in large measure intangible and we find that

most inconsiderable plants, animals and ecological relationships are important parts of the resource both for enjoyment and for maintenance of the biome. The fact that few people understand the scientific detail of the ecology makes no difference to the assumption that a landscape in ecological repose is generally one that gives pleasure.

Was there a moment of optimum in the history of the National Park System of the United States? Possibly not, because there was constantly an informed feeling that certain other areas and examples of natural phenomena should be brought into the system. In this connection, it is interesting to note that President Lyndon B. Johnson wishes to see the acquisition of areas to be more or less complete by 1972, the centenary of the designation of Yellowstone National Park — a worthy aim, indeed. But admitting incompleteness at any one time in these hundred years, was there an optimal moment when staff, terrain and folk were in some relation that achieved a maximum of quality of enjoyment of the resource, in appreciation and wonder at the landscape and its animate and inanimate parts?

We would venture to suggest what cannot be substantiated and must remain a subjective statement, that the period 1935-1940 was in the nature of a peak of both achievement and enjoyment. Morale in the service was very high and the visitors found it possible to gain that experience of a national park which had been the ideal of the pioneers of the movement. Architectural standards were high, there was a beginning of ecological awareness within the Park Service, and pressures from visitors and cars were lower.

We return to the question, “What is a national park for?”, which, if satisfactorily answered, should help to define what a national park should be, irrespective of the several differing reasons why areas are designated as such. Everglades was designated primarily because of the wonders of the wildlife, plant and animal, in the unique set of circumstances. A new research plan for this park indicates a re-emphasis of the primary obligation and the need to implement it. Certain developments and trends in other national parks in the last 15 years cause us to doubt whether, even if now feasible, there will ever be a real return to a purer conception of the national park. We are well aware that there must be evolution in conceptions and trends but we find ourselves unable to get away from the uncomfortable impression that policy is philosophically unsure and that this is contributing to the general deterioration apparent in several properties.

Further uncertainty is exhibited by the multiplicity of decisions and different policies resulting from excessive decentralization. The early conception of the National Park Service was for close overall control of properties by the central agency. Despite the obvious necessity for some

proliferation and for more flexibility of action within each park, the need remains for the Service to act as one being, firmly convinced in its policy.

Yellowstone is the progenitor. When first designated, the block was square on the map, cutting with superb geographical indifference through mountains, water and valleys. The boundaries were marked quite plainly on the map, but this initial demarcation was never made obvious on the land itself. This scarcely mattered at the outset: the first necessity was to make the idea concrete and be sure that the natural wonders of the Yellowstone were within the boundaries.

Yellowstone National Park was all federal land, much of it unexplored in detail. In general it was not likely land for white settlement; and the timber, mostly lodgepole pine, was of no consequence commercially. There were the objectors, of course, who could give a high-flown moral tone to their reasons in Congress against land with possible commercial resources being put out of reach, but the objectors were no serious threat. Nevertheless, the breed is a hardy one; the present magnificent national heritage is constantly under pressure from some local interest or other.

The art and craft of administering and caring for a national park had to be learned from scratch. A director without salary or appropriations could do nothing but protest, which doubtless had some value if a good notebook was kept. Poaching was rife and so was vandalism of the thermal curiosities. But with a bank of 3,200 square miles, or more than two million acres, the government had something to bargain with in adjusting boundaries along more sensible geographical lines, though ecological lines were not as yet understood. Meat, hides and skins were exported from the park as late as in the early 'nineties, though a small ranger force had by then been appointed.

Hotels were built at Mammoth and near the Old Faithful Geysers. These being days of the horse, there were literally hundreds of them in the park in summer, naturally being pastured in the park even if the stables near the hotels meant adventitious food being brought in. No one farmed in the park, so masses of manure accumulated and so did the litter from the hotels.

If we boggle at the problems of today, we should not forget what faced the early administration. The problem today is numbers of visitors rising steeply, but at least there is a National Park Service and a considerable body of know-how. The problem then was of unforeseen situations piling up with little or no money and no legislation for the support of law and order. There is something amusing today in the Governor of Wyoming being asked in 1883 for help in restraining poaching and vandalism. Wyoming resourcefully provided a corps of "assistant superintendents", the justices of the peace among them getting their fees for each case and

the policemen getting half the income from fines. The result was a racket and this law was repealed in 1886.

State politics were active in the park also with regard to concessions for the housing and feeding of tourists, for guide work, and horses. The Yellowstone Boat Company was running steamboat trips on the Lake from 1896-1908 and, what appears preposterous to us now (despite a few bison at Platt and Grand Teton), some bison, elk and mountain sheep had been fenced in on Dot Island where the boat called on the trip. All this finished in 1908.

The story of the growing pains of the national park heritage has been admirably told by John Ise in his critical history, *Our National Park Policy*. Part Two of this great book describes the several administrations under different directors since the establishment of the National Park Service in 1916 with Steven Mather in charge. This date is memorable for it unified administration and made codification possible. Mather was an example of a rich man giving the rest of his life and a large part of his fortune to achieving what he thought a National Park System and a National Park Service should be. Through the vigor and charm of his personality élan was high and the panache incomparable. Not only has the force and excellence of his administration persisted far beyond his short directorship of 12 years, but the spread of the national park idea about the world has been attended with the same ideals as to standards even if these are not always reached.

Ise quotes the now famous letter of May 13th, 1918 of Secretary Lane to Steven Mather outlining administrative policy. We quote Ise's paragraph (pp. 194-5, *op. cit.*) and then give our opinion and comment as to whether subsequent history has confirmed these instructions:

1) LANE: "First, that national parks must be maintained in absolutely unimpaired form for the use of future generations as well as those of our own time; second, that they are set aside for the use, observation, health, and pleasure of the people; and third, that the national interest must dictate all decisions affecting public or private enterprise in the parks".

Our comment: Are the two instructions here set out contradictory and therefore unworkable? The third is a pious hope. Our feeling is that the ideals of this paragraph have not been fulfilled and probably could not be. This paragraph is the rhetoric of which most of us are guilty, faced with such a situation.

2) LANE: "In all parks but Yellowstone grazing by cattle but not by sheep might be permitted in areas not frequented by visitors."

Our comment: This has been adhered to, but we know now cattle can be very harmful. Even with such knowledge, cattle persist in Organ Pipe Cactus and Saguaro National Monuments.

3) LANE: "There should be no leasing for summer houses."

Our comment: Firmly adhered to by the Service.

4) LANE: "There should be no cutting of trees except for buildings and where it would not hurt the forests or landscape."

Our comment: Nature may heal some of the scars, but history must remember the falls from grace. Timber was sold from Olympic National Park, only some to cover development costs, and lodgepole has been felled unnecessarily or even perilously in new caravan and camping sites in Yellowstone.

5) LANE: "Roads must harmonize with the landscape."

Our comment: Some magnificent achievements and some debatable ones, as was surely inevitable. The new road in McKinley is scarcely even debatable.

6) LANE: "The Department and Service should urge cession of exclusive jurisdiction in all parks where it had not been granted."

Our comment: Progress towards this has been steady and purposeful, but the states will not let go of their fish and some areas are open to mineral claims.

7) LANE: "Private holdings should be eliminated."

Our comment: The lag in implementation is expensive. Quite inadequate funds allocated to this end. The parks are suffering severely, but the National Parks Foundation is designed to achieve acquisition of inholdings.

8) LANE: "All outdoor sports, including winter sports, should be encouraged."

Our comment: Contradictory to No. 1. In general, National Park Service has not complied.

9) LANE: "Educational as well as recreational use of the parks should be encouraged."

Our comment: Whether one agrees with all that has been done or not, this instruction has been fulfilled conscientiously and enthusiastically. The result is impressive.

10) LANE: "Low-priced camps should be maintained, and high-class hotels."

Our comment: So low that they were something for nothing for 14 nights, and well used. The high-class hotels are like the curate's egg — good in parts. Some concessioners are too comfortable — more so than their clients.

11) LANE: "Concessioners should be protected against competition if they were giving good service; and they should yield a revenue to the government, but the development of the revenues should not impose a burden on visitors."

Our comment: Should this protection allow a concessioner to erect new buildings in a national park when the avowed policy is to move buildings from the park altogether, including the rangers' houses? This dictum of Mather's has not been re-examined in the light of changing circumstances.

12) LANE: "Auto fees should be reduced as motor travel increased."

Our comment: Perhaps auto fees should be increased as motor travel has so far increased.

13) LANE: "The Service should use the Railroad Administration to advertise the parks and should co-operate with chambers of commerce, tourist bureaus and auto-highway associations to advertise travel to the parks."

Our comment: This would now appear to be an archaism. Also, national parks need no advertising. Rather would a reduced consumption of them be an advantage. We have felt in the course of our travels that national parks no longer require chamber of commerce-style promotion.

14) LANE: "The Service should keep informed as to municipal, county, and state parks and co-operate with them."

Our comment: This has been done well, sometimes too well, as when a regional recreation area is run by the National Park Service. This function has been assumed by the the Bureau of Outdoor Recreation and it is our opinion that it is not in the interest of the National Park Service to be diluted with this function.

15) LANE: "The Service should co-operate with the Canadian Park Service."

Our comment: This has been done. The Waterton-Glacier International Peace Park is an outstanding example.

16) LANE: "In studying new park projects, the Service should seek to find 'scenery of supreme and distinctive quality or some natural features so extraordinary or unique as to be of national interest and importance'."

Our comment: This has been done and the interpretation of "natural features" has been extended to include biological values not immediately obvious.

17) LANE: "The national park system as now constituted 'should not be lowered in standard, dignity, and prestige by the inclusion of areas which express in less than the highest terms the particular class or kind of exhibit which they represent'."

Our comment: This is a corollary of (16) and however rhetorical or piously hopeful the instruction may appear, it is a good one, but interpretation has to adapt a little to modern ways of seeing things. Would Mather have accepted Cape Cod and Acadia? Possibly not, but in 1960 the decision to designate them seemed completely justifiable. We nevertheless

think it misguided to include such recreation areas as Lake Mead and Shadow Mountain.

18) LANE: "Parks need not be large."

Our comment: Perhaps not. Meaningless.

19) LANE: "The Service should study existing parks with the idea of improving them by adding adjacent areas; for instance adding to Sequoia and adding the Tetons to Yellowstone, and should co-operate with the Forest Service in planning for this."

Our comment: This is excellent. In general, this instruction has been well interpreted. The Tetons have become a park on their own.

Isse thinks it as likely that Mather wrote the letter for Lane to sign as that he merely co-operated in writing. Occasionally one feels the ideal was not crystallized and therefore would be incapable of being fulfilled. Throughout, one finds no mention of wildlife or wildlife policy and no ecological notions whatever; we can see that from such a wise and statesmanlike manifesto following nearly half a century of almost failure, it would be difficult to graft on the biological philosophy which is now generally held by critics of the policy of the National Park Service. It is our own feeling that the Service has both resisted the biological and research attitude and at the same time accepted it cautiously and parsimoniously. If we deplore the slow pace to full acceptance, we nevertheless realize how much else there was to do and how well it was done. Our thinking is almost entirely in line with the Leopold and Robbins Committees whose attitude in short is that unless a biologically informed policy is fully accepted and initiated immediately, the status of the national park heritage is going to deteriorate in all those qualities which inspired its designation.

One thing is certain: there can be no absolute set of standards and statement of policy, and any manual of national park management must emphasize the need for flexibility and impress the fact that every park or monument is such by virtue of individual claims to beauty, history or scientific interest and uniqueness. Flexibility should be always in the realm of procedure enlightened by knowledge, and not in principles driven by expedience.

It is necessary to examine certain democratic convictions critically in relation to national parks: because they are out of doors, is the visiting capacity to be limitless? If we have a finite building in which an orchestra is to give a concert, the seats are reserved and unreserved and there is a limited amount of standing room, but when the building is full it is full, and if there are any doubts, fire regulations are posted at the doors, proclaiming the numbers of persons it is lawful to accept into the building.

A national park has linear boundaries and a vast amount of empty

air (even a concert hall has that) but its capacity is a matter of subtle and expert assessment. If the stage of "standing room only" is reached, the natural pageant which the people have come to see is largely obscured and the occupants of either reserved or unreserved seats will receive either a poor or even negative return for their trouble in having travelled to a national park. The fact must be faced up to that in our era of growing population, more leisure and increased mobility, a national park has need to post a "house full" sign at the gates long before "standing room only" is reached, for it is not merely reduction of enjoyment of the concert which concerns us, but damage to the national park which may be more fragile than a concert hall.

We have been under the impression throughout our survey that visitor statistics showing high rates of increase year by year are welcomed as valuable weapons in getting larger appropriations for the National Park Service. Development takes place which will encourage more visits rather than conserve the unique habitats which the parks represent. The supreme example of what appears to us as wholly mistaken policy at this time is the erection of a large building at Petrified Forest on Highway 66, specially designed to entice the public from the highway and to advertise the National Parks and Monuments. This large building deriving from the pueblo style is so much larger than any pueblo and so lacks the varied surface texture of genuine pueblos that the effect is saddening. An intimate style carried to the megalithic is self-destroying. The building itself violates pristine national park thinking, but its function seems to us out of phase because the present urgent problem is how to cope with 120 million visitors each year to the parks; there is no call for advertising the attractions. As the situation of the national parks is at present contrived, the steeply-rising number of visitors should be the warning needle of the pressure gauge, not a matter for congratulation.

Thinking independently as individuals we have both felt uneasy about the conception of Mission 66. It has seemed to us that this operation over 10 years has been to increase visitation, making it easier to get into the national parks and that the visitors should be more comfortable in various ways once they are there. Mission 66 has done comparatively little for the plants and animals.

The enormous increase in drive-in campsites is an example of very expensive facilities which do nothing at all for the ecological maintenance of a park. Some superintendents have resisted proposals to increase drive-in campsites because they restrict ranger activity and impose a burden beyond the capacity of the existing staff. Part of a ranger's responsibility is to get around his beat of the park and to know what is happening in fields other than the human; in fact, at the busiest time when he should be



everywhere he tends to become a camp-ground supervisor, not the pleasantest of jobs let the public plainly understand.

Since our own visits in the national parks and monuments one considerable hurdle has been overcome; namely, a charge for a drive-in campsite. These sites tie up large amounts of Uncle Sam's capital, something of the order of \$2,000 to \$3,500 per site when the access roads to the colony are included. Now that 14 free days are a thing of the past and a charge can be made, we suggest that the charge should be varied and flexible so that in a park proving too popular for its ecological health, the campsite charge can act in some measure as a brake on visitation. We would go farther and say that in an age of better roads and automobiles no more campsites should be made in national parks, and when the present ones need repair, in most cases they should be abandoned and helped to return to the biome by natural succession.

Demand for camping space might be controlled to some extent, while at the same time reducing the considerable uncertainty attending a hopeful camper's finding an empty spot at a busy weekend, by requiring advanced bookings for the most popular camp grounds. Returning briefly to our earlier analogy, the manager of a concert hall cannot be host to more people than the hall was designed to hold, and the acoustical properties of enclosed spaces limit capacity to a few thousands at the most. To be sure of getting in, a concert-goer must make reservations in advance. Since national parks, too, have limited capacities, it does not seem unreasonable to require those persons wishing to remain overnight also to make reservations in advance. Indeed, it would not be inappropriate to extend the idea to include even day use of such over-popular national park attractions as the Yosemite Valley and Cliff Palace at Mesa Verde.

Another possible control on camp ground and park use might be a higher entrance or user fee, as has been proposed by Marion Clawson of Resources for the Future. Rates could be adjusted to make the most popular spots the most expensive. Curiously, the new Land and Water Conservation Fund entrance permit, called the "Golden Passport", reduces season rates at most national parks by more than half. Where an increased charge for entrance to a national park would seem sensible in a time of over-use, here is an inducement to entry. The "Golden Passport" costs \$7.00 and is valid for the season in all national parks, all federally operated camp grounds and all other federally operated recreation facilities. Formerly, a season's permit for one of the larger national parks cost \$15.00 and was valid for the one park only.

One officer in one of the parks we visited gave us a phrase which we think cannot be bettered. He thought that if the parks were to be preserved in face of steeply-rising numbers of visitors which are politically

difficult to control, advantage should be taken of what he called "built-in frictions" to apply the brake. The 30 miles of dusty road into Chaco Canyon was precisely such a built-in friction; failing immediate power to implement a well-planned policy of how to deal with the increased use which the automobile is bringing, it was folly to improve the existing road.

Thinking in these terms we would emphasize again that each park presents a particular ecological situation and the only absolute administrative principle can be to consider first the ecological health of a park so that it shall endure for posterity. Thus, we are in sympathy with the proposed construction of a four-lane road through the Great Smoky Mountains National Park if the new Interstate Route 40 just north of the park does not prevent traffic jams on the existing two-lane road and reduce the amount of emergency roadside camping which is at present a serious problem. The rapid regenerative power of this habitat, the steepness of the ground and density of the forest, and the fairly high rainfall, all help in taking care of this large park. Administrative activity can well take the line we were given there in the slogan "Conservation through development", though there are evident dangers of it being overdone.

We have implied that thought on policy must be flexible and have regard to history and change. How far is present policy an unthinking continuation or adherence to that of the pioneer stages of the national park idea? Yellowstone covers 3,200 square miles of high, rough and remote country. At least it was remote in 1872 and until, possibly, 1920. If it was to be visited, it was obvious that lodges such as those at Mammoth and Old Faithful should be constructed. The journey from Gardner to Old Faithful which once took two days now takes two hours. It is our opinion that the conditions of travel which necessitated accommodation centers within the parks have served also as a mental block to provision of all such facilities outside the parks, where they should be in an age of swift travel and heavy use.

If the national parks are to continue to be a retreat from urban civilization for increasing numbers of people, much of what was permissible in the less-crowded past will need to be more carefully controlled or eliminated. The Park Service has begun to move hotels and camp grounds away from the most spectacular scenery, but not very far away; the parks are still dotted with little islands of civilization. Current expensive development, designed to meet present demands, too often does not envisage long range values.

The Yosemite Valley is the heart of that lovely national park and its most wonderful feature. The Independence Day visitation in 1966 was 54,700. There are nine grocery and general stores in the Valley, seven

service stations, a laundry, a barbershop, three swimming pools, a stock stable and 4,500 hotel accommodations. Camp grounds are heavily crowded and even the crime rate is increasing.

Our statement that the only absolute administrative principle in the National Park Service is to make ecological health or repose of an area the first consideration is but one way of expressing an idea which has been independently put already by the Leopold Committee on Wildlife Management in the Parks. Their report says "The major policy change which we would recommend to the National Park Service is that it recognize the enormous complexity of ecological communities and the diversity of management procedures required to preserve them". The Leopold Committee was considering wildlife management; our field is larger in that it includes the traumatic action and metabolic activities of that dynamic seasonal immigrant animal, Man. We have had the uncomfortable feeling in the course of our work that such members of the National Park Service as have a high ecological awareness are not taking a significant part in formulation of policy. They should be brought to the ultimate council table.

Development



The National Park Service tells us, we think much too frequently, that “Parks are for People”. Our earlier dismissal of the phrase as inappropriate huckstering does not mean that we are unaware that the parks are indeed for people. In fact, “people”, “park visitors”, whatever they are called, are responsible for most of the change and development which takes place in and around the national parks. In a sense, even the wilderness portions of the parks are developed since there are trails even in the most remote places. In speaking of development, however, we are referring primarily to those constructions which prepare the park for the ordinary, nearly car-bound, tourist.

We learn that 5% of the Yellowstone National Park is taken up by development, a proportion which seems to us inordinately high, for the traumatic influence of this 5% will be over a much larger area. However, our point is that much of the recent development need not have been within the park at all. For example, the new employee housing area at Mammoth Hot Springs is plain poor planning (especially when remembering that Yosemite is taking ranger housing outside the park, but here we have two administrative regional headquarters pursuing opposite policies). Gardner, five miles to the north and outside Yellowstone National Park, 1,000 feet lower and far more accessible in the winter, would have been a better location for many reasons of cost, landscape and access to

schools and stores. The good sense of this is admitted by the National Park Service but a policy of hesitation has won the day and the new Mammoth is a new eyesore.

Canyon Village is another seasonal community which covers large acreage and is difficult to justify in its present position. It could just as well have been outside the park and would have played a larger part in the economy of the state of Wyoming. In addition to a large plaza with supermarket and gift stores and art shop, there are 1,500 duplex cabins where one can distinctly hear his neighbor breathing in sleep, though this is the pleasantest sound to come through the flimsy walls. Our stay there conveyed to us none of what we have heard called the national park experience; or perhaps this *is* the modern national park experience, at \$11.50 per night. Some would justify the existence of Canyon Village because of its proximity to points of high scenic value in the park. We would take the view that this is a prime reason why Canyon Village should not be there.

The same objections apply to trailer camps and automobile camps. They could be outside the park. The trees have completely disappeared from parts of that national park slum called Fishing Bridge; many trees were felled to make the large new trailer and automobile camp at Grant Village, where the rest of the trees are blowing down through lack of support and shelter by their fellows. The very term "village" indicates the present dangerous trend of thinking in national parks. We were in Grant Village just before its dedication and were depressed by the sense of dereliction already palpable, for the village was by then occupied.

The acceptance of the necessity of gas stations and restaurants in Yellowstone with its 250 miles of main road is inevitable, but it should be no precedent for similar facilities in such small properties as Bryce Canyon, where there are but 25 miles and where commercially owned facilities are already located less than three miles outside the park boundary.

We have referred earlier to what appears to be timidity in allowing further building to take place where it is admitted existing buildings would be better removed. Big Bend National Park has as its heart a magnificent basin surrounded by the steep and spectacular Chisos Mountains. The park headquarters has been built 10 miles away outside the basin and it might have been hoped that further development would not have been in the basin. There had been some building of modest accommodations before the property was given to the nation by the state of Texas, when a C. C. C. camp was established in the '30s. These hutments had later been run as a hotel operation and further service buildings had been erected. National Park Concessions, Inc., put up some more and better accommodations and there is now a good deal of sporadic unplanned development



to be seen from the ground above the basin. Hutted or motel-type accommodation is available for 183 persons and there are roughly 100 campsites, for a possible further 300 people. There is also a gas station and a pasture for stock. In our opinion the basin is getting too full. More building is to be done by the concessioner but the new facilities will replace Dallas huts and there will be no increase in the number of beds. The National Park Service has tried unsuccessfully to reduce the campsites, realizing how easily the basin could be spoiled.

A bolder policy of bringing back the basin to something approaching its pristine state would result in a major scenic asset being able to make its full impact. We realize, of course, that we are suggesting a counsel of perfection, but it would be deplorable if the basin became a little Yosemite Valley by small stages for lack of a forthright initial policy. The campground at least could go or be redesigned, but the concessioner's new and existing buildings must be accepted for the coming 25 to 30 years till they need renewal. As everyone believes, the National Park System is as near as may be eternal, so that a temporary check of a generation or so is not disastrous unless the terrain is so fragile that even a few years' occupation will degrade it beyond recall. The Big Bend Basin, happily, is a more stable habitat than the surrounding mountains and desert.

A continuation of the road into the basin from park headquarters and the northeast through the northwest to the Castolon road would help the flow of motor traffic through an ultimately unpopulated basin. The basin is at present a cul-de-sac for motor traffic and there is a natural expectation in the public mind of various facilities there. We also thought that a hotel in the neighborhood of Castolon would be an advantage in general management and enjoyment of the wholeness of Big Bend, for the canyons of the Rio Grande are probably the most spectacular features.

Earlier in this report we commented that in many respects the period 1935-1940 could be thought of as an optimum in the management of the national park resource of the United States. The standard of national park architecture was very high indeed, achieving a fitness with the environment — and that so varied — which had obviously needed sensitivity in the design office. A well-illustrated book on park structures was issued by the National Park Service in 1935, compiled by Conrad Wirth 16 years before he became director of the service. The architectural principles and ideals set forth are impeccable and are supported by photographs of existing entrances, signs, restaurants, accommodations and so on. Observers from overseas looked on this book with longing and respect. Mr. Wirth's vision was further apparent in the 1940's when he produced Fontana Village, just outside the east boundary of Great Smoky Mountains

National Park, from the laborers' dormitories of a dam construction camp. Well-equipped cottages can be rented by the week and there are a community center and a restaurant. Good roads wind through well-timbered development quite inconspicuously. Fontana Dam itself, which abuts the park, is part of TVA, its functions being primarily power production and flood control; in fact, however, the dam integrates beautifully with the scenery of wooded mountains and provides fishing and boating for visitors.

When we were in Santa Fe we visited the regional headquarters office of the National Park Service and found the building and interior furnishing a most pleasurable experience. The Hispano-Pueblo type of construction is entirely satisfying here. The interior was furnished with good Navajo rugs and some fine modern Indian pottery, including a superb large black jar by Maria Poveka Martinez. Her work surely graces the premises of any national park, for her art is part of the true heritage of America.

With these standards so much in mind we have been less happy about more recent buildings, especially if the office of design is far removed from the site. We have remarked on the new staff housing at Mammoth in Yellowstone, which could scarcely be more out of keeping, and though there is nothing wrong with the individual houses of the new ranger village at El Portal outside Yosemite National Park, the layout of the site with a grid of streets is unimaginative and depressing. Not the National Park Service but Congress must be blamed for the parsimony which left the whole site in a raw unfinished state to be landscaped by the rangers themselves (who, of course, could be relied on to give of their spare time and money in doing this).

Another distressing departure from the standards of 1935 is apparent in Camp Eielson Visitor Center far into McKinley National Park, Alaska. The building itself is an appallingly ugly structure set ostentatiously on a knoll in a sublime valley, looking across to the massif of Mount McKinley. The building bears no relation of any kind to the landscape and is obtrusive to say the least. Earlier standards made a point of the buildings not being so.

Lest we be thought to be architecturally reactionary, may we record our delight in the controversial building in Dinosaur National Monument which exhibits the actual face of the quarry in which the skeletons of dinosaurs were set by nature. The glass roof follows the line of the hill which would appear had not the quarry been excavated. This visitor center-*cum*-museum is brilliantly conceived and we cannot imagine the spirit not being lightened by seeing and entering this building. Further into this 205,000-acre property the natural sandstone architecture of canyons and gorges



is superb and uplifting. We were desolated, then, gazing from an overlook to see camp grounds below. Their siting here was quite unnecessary.

It would seem that the presence of a resident landscape architect in a national park is a considerable insurance against bad siting and bad design. Presumably he becomes identified with his terrain and feels for it. First thoughts are given a second time round and revised or even drastically altered or abandoned. It needs time for the unconscious to work and throw up significant points to the conscious mind. One of the reasons for the change from architectural styles of 1935 may well be that the buildings produced from such designs today would be far too expensive. We should accept the point and say how doubly careful one must be in siting them and modifying them to fit a particular landscape. The example in our mind is situated in Olympic National Park; here the central core of the park remains inviolate and is intended to continue in its wilderness state. The main visitor center of the park is in the city of Port Angeles and comes into the life of that community as a museum and meeting place. Staff housing is also being placed outside the park. A small visitor center in the Hoh Valley drew our admiration for the forethought evident in its placement and the way in which it drew the habitat of temperate rain forest into itself by a picture window showing two enormous trunks of Sitka spruce just outside. Landscaping here was of a high order and extremely subtle in its unobtrusiveness, yet its order of architecture was entirely modern with no vestigial remains. The architect was resident in the park; he had studied the site and what it had to give rather like a Chinese painter of the past who contemplated the scene impassively and receptively for a long time before he committed himself to the drawing board.

Modern economical construction not giving way to stylistic whims can give great pleasure in landscapes of widely different kinds. We were impressed by the buildings grouped at Cumberland Gap National Monument as being an asset to the city and community of Middlesboro. The buildings are in the property but only just and really much more part of Middlesboro. Their influence on the human ecology of this generally depressed area could be considerable.

The modern building at Saguaro National Monument fitted well into the desert landscape and once inside a picture window allowed a visitor to have a surprisingly lovely "vignette" (to borrow the expression of the Leopold Report) of what this property meant, both near and far within the desert biome. We did not ask how the quail were tempted to remain more or less in the foreground of this living landscape, for the reason may have been slightly foreign to strict national park principles, but the presence of the quail made our visit to this visitor center a memorable experience.

There are occasions when a national park building cuts across the *raison d'être* of the park. We felt that an example of this was the visitor center and parking lot at Carlsbad Caverns, New Mexico, where the seepage of rain-water into the caves is blocked by the presence of the new visitor center and its attendant parking areas, causing desiccation and interference with the formation of stalactites. This interjection implies no criticism because we have the advantage of hindsight, but the example does show how circumspect one has to be in caring for natural wonders.

We had the advantage at Rocky Mountain National Park of meeting Dr. Beatrice Willard (Mrs. Scott-Williams) who has done (with the assistance of Dr. John W. Marr) much research on the effects of visitors on natural ecosystems in this park, on contract between the University of Colorado and the National Park Service. The work is fascinating, not least for its sidelights on human behavior in national parks. Visitors to the alpine tundra seem compelled to pick up pieces of stone, either as souvenirs or attractive additions to their home rock gardens. Flower picking also seems to be irresistible to some people. Dr. Willard thinks vigorous efforts are constantly necessary to remind people not to take stones and flowers, and conversely, not to leave litter. All these activities adversely affect these high-tundra ecosystems. Even plain walking is markedly deleterious: one year's walking appears to allow recovery, but after two years' use there is none. Cut and fill scars need turfing because there is no appreciable natural recovery after 20 years. Placement of campsites should be guided primarily by the exigencies of alpine ecology and horse use should be prohibited in the few meadow areas. The skillful placement of hitching rails on horse trails can be helpful. Dr. Willard's comments on camp grounds were illuminating: areas that are dry and have relatively little ground cover at the outset are least altered by the cumulative effects of heavy camping; areas having greater soil moisture and ground cover are most seriously and lastingly altered by camping use. Channeling of visitor use has been found to be the most effective way of reducing visitor impact adjacent to parking areas. Once channeling is resorted to, informal paths made by unchanneled visitors must be obliterated or such paths will continue to be used. Dr. Willard and her colleague emphasize that ecosystem balance and carrying capacity must be determined in each case; they use the term "visitor consumption" as the equivalent of "carrying capacity" which we would normally use for animal use. The ecological processes set in motion by visitors differ in detail from those activated by grazing animals, but the end result is more far-reaching in destruction of ecosystems in localized areas.

One most interesting point brought out by Dr. Willard referred to a situation much lower than the alpine tundra, concerning an area of only a

tenth of an acre near Paradise Park in Rocky Mountain National Park. Here grows a fern very rare on the Southern Rocky Mountains, namely *Dryopteris dilitata*. It so happens that a footpath bisects this tiny haven of the fern; to clear fallen trees from the footpath in such a fashion that users would keep to the footpath and not diverge from it would be a useful measure of conservation, a touch in the art of management only possible because a botanist could point to the occurrence of the fern in such a small area.

The difficulties of conservation in such a heavily used park must be almost heartbreaking and one wonders when the education which the National Park Service so sedulously fosters and promotes will influence public attitudes. We quote the following passage from Dr. Willard's report:

"Nine campsites were found along the mile-long extent of the north shore of Lake Verna. Five of the six sites near the outlet appear to receive most of the use. All but one of these five are in fairly good shape, but this one shows heavy impact from visitor use. Nails have been driven into trees, the roots of the trees have been burned, 2-4 inches of forest litter and topsoil have eroded from the ground surface, leaving it pulverized and bare of litter. Several stumps are chopped, one tree is burned, and about a dozen spruce trees have been cut.

"The endeavors of the rangers to clean up the north shore of Lake Verna and to establish permanent fireplaces have contributed significantly to an improved appearance of these campsites. Many gunny sacks of noncombustible debris have been collected and hauled out. [The place is fairly remote.] If the results of this effort are maintained, the ecosystems adjoining this area will be allowed to recover."

The other "if" concerns the future behavior of summer sport fishermen from the resort community of Grand Lake and Shadow Mountain National Recreation Area.

Dr. Willard's report is the kind of document which should be available for every national park and monument, for it is upon this kind of information that effective management for perpetuity can be based. After our visit to Rocky Mountain National Park we were convinced, had we needed much further conviction, that the campsite policy in the parks needs drastic overhaul leading to a change from proliferation of campsites to curtailment. The final question must be, are the parks to be expendable or are they to be handed on to posterity unimpaired?

Camp grounds are extremely expensive of space and it is always difficult to make them esthetically pleasing when in use, for the automobile and trailer together are no architectural addition to our culture. The camp ground seems to us rather a fetish: it is supposed to recreate for the public the joy of living in the open air, smelling wood smoke and seeing the stars, as so many pioneers were able to do. Putting aside false senti-

ment, the main attraction of the camp ground is that it costs so little to the user. It is a principal anxiety to the ranger staff.

The psychology of the camp ground is something else and to some of us a quite baffling phenomenon. Mr. Lon Garrison told us of his study in Yosemite in the '30s during which he found that many people apparently liked being crowded in camp grounds. At least, when the density of occupation of camp grounds decreased after Labor Day, there was a general movement from the outliers to the center, where the density consequently remained high.

We would repeat that throughout the national parks and monuments the whole principle and policy of camp grounds should be re-examined and clarified and not be obscured by romantic notions which are not quite true. Obviously, a family must be able to accommodate itself cheaply on a tour of many of the parks and monuments, and camp grounds are popular, but as the significant camping population moves in automobiles, these facilities should not continue in the choice areas of national parks. In most cases there is plenty of room for them outside the parks. In a few parks, as for example Big Bend, long distances or scarcity of sites with a dependable water supply make it almost mandatory to provide accommodations within the park. The camp ground and trailer camp near Boquillas Canyon seemed to us the model of what we have in mind for such facilities removed from focal points.

An incidental facet of the whole motor camping movement is the change in the character of the motel. These were once called "tourist cabins" and were very modest accommodations, cheap but decent, but such are now hard to find. The modern motel is more ambitious, with wall-to-wall carpeting and television, and far more expensive. Perhaps the National Park Service could subsidize plain accommodations outside the parks rather than make costly and unsightly camp grounds inside the boundaries.

If buildings and camp grounds are important as objects of early research preparation, they are no less so than roads and their location. Roads draw traffic, quite apart from relieving it elsewhere. Also roads have a habit of acquiring power in their own right. Throughout our history, roads, rights of way and easements concerning them have been major items of legal argument. Roads in and near national parks are tongues of penetration calling for highly concentrated thought and expertise in their planning, yet in the eyes of many people, not least the local politicians and business communities, roads are of essence good and rewarding. This philosophy is constantly pressing on the National Park Service and is even accepted by some individuals in the Service.

We first encountered this type of hazard to the welfare of a national

park in the Great Smoky Mountains. There is one trans-mountain road, Route 411, which is a public highway of long standing. It becomes one of extreme congestion in the summer months, with traffic jams of up to two hours, and we expressed earlier our sympathy with the suggestion that this very spectacular highway should be made a four-lane divided road. We could see no good objection to this plan, although it is conceivable that the proposed Interstate Route 40 coming east of the park would take much of the through traffic which at present swells the park visitation willy-nilly. Since our visit a different course has been proposed and it has the approval of the National Park Service; namely, to build a new trans-mountain road, from Bryson City to Townsend, across the main wilderness area of the Great Smokies. With all deference to the supporters of the proposal, which has almost solid local political and chamber-of-commerce backing, we would disagree entirely. We know that quite insufficient research of any kind has been done to justify a new trans-wilderness road and we feel that the doubling of Route 411 and the construction of the new Interstate Route 40 would cope with the situation now and for the future. Furthermore, making Route 411 into a dual highway would make driving on it much safer and drivers would be able to enjoy the scenery, which they do at their peril at the moment.

There is an obligation of long standing on the National Park Service to build a road from Bryson City along the north shore of Lake Fontana; this obligation arose from a gift of 40,000 acres to the park by the Tennessee Valley Authority, which body had flooded the existing road in Lake Fontana. As there is a good road already to the south, the need for the road is much diminished, though the obligation undoubtedly remains. This is now giving weight to the proposal for the new trans-mountain road which really has nothing to do with obligation. Our own view is that a good marina at the east end of Fontana Lake just west of Bryson City would relieve the obligation and provide that community with a first-class commercial opportunity.

A further objection to the newly proposed trans-mountain road is that it will inevitably become a scenic highway rather than a limited access throughway. There will be service areas, camp grounds, short penetrations from the main road and conceivably building of some sort. We are heartened to learn that a committee of 10 southern university and laboratory scientists has made an intensive six-day visit to the Great Smokies and has unanimously condemned the idea of the road. This kind of information should have been gathered by the National Park Service long before the proposal reached the stage of public hearings.

As far away in the National Park System as it is possible to go from the Great Smokies, McKinley National Park in Alaska also has a road

problem. The delineation of this park took place when the fact of the highest mountain on the North American continent seemed the whole reason for establishing a national park. The result was a 100-mile strip from the railway at McKinley westward to include the mountain, Wonder Lake, and the northward flowing glaciers as far as Mount Russell. The strip reaches about 40 miles in width at one point on the Toklat River, but in the neighborhood of Camp Eielson it is barely 25 miles wide. There is a migration of caribou through the park and there are fine populations of Dall sheep and grizzly bears, as well as some wolves. They have not much latitude of movement. It need scarcely be said that the park should be much larger on the northern side to accommodate the wildlife, which is one of the major attractions of the park, although the reason for not making it larger in the first place was obviously that the northern country was of comparatively minor scenic value. Alaska was so large and relatively untouched at that time that it was thought unnecessary to extend the park to the north for the benefit of the wildlife. Kantishna, also, was a mine, since abandoned, but nevertheless as a mine it had an inviolable quality sufficient to keep the park to the south on a broad front.

The road into McKinley National Park is 87 miles long from McKinley Station on the Seward-Fairbanks railroad, winding for nearly two-thirds of the length of the strip and terminating at the north end of Wonder Lake where a glorious view of the mountain may be had when the weather allows. And from that sublime moment the visitor must turn round and go back. The old road was narrow and liable to hazards such as an *aufeis*, what the sourdough would call a "glacier", and possibly landslides. It was picturesque, slow, and not obtrusive in this fine country. Indeed, it tended to disappear as it wound alongside narrow river valleys. One grew to like this road through the years.

Mission 66 must, in this instance, have looked far beyond the present visitation figure of 22,000. The road has been widened as far as Camp Eielson, often straightened and often raised from the little valleys to where more scenery can be viewed without getting out of the car. Unfortunately, the corollary of this is that from afar in the park, the walker sees much more of the road. Furthermore, there are great lengths of cut and fill forming white scars which in that climate will not heal in a century, and it is far from certain whether the slopes of fill represent the angle of rest. Erosion of these slopes will make this road expensive to maintain. The new road, all in all, is a piece of official vandalism on the landscape; it does not run with nature but against it, and it is ugly because it is ecologically unacceptable. Finally, wide roads without awkward corners foster high speeds, despite the admonitions, and as this road is not black-topped, a great cloud of moraine dust is thrown up by every car, just as

discomfortingly as it is on the roads around Anchorage. This kind of progress could have been kept out of the national park and the effort put into enlarging it on the north side so that a loop road might have been possible.

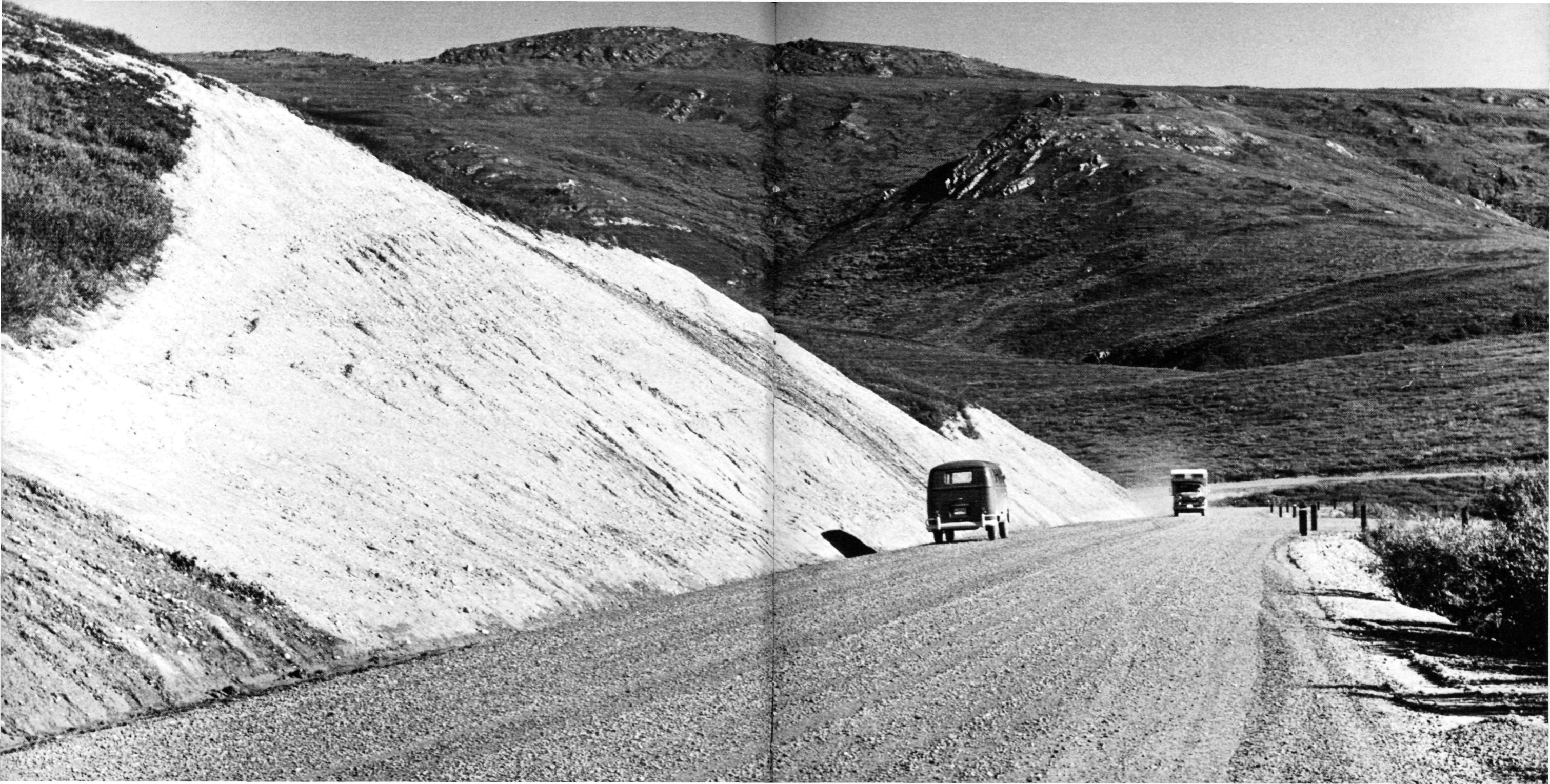
Another road which has caused adverse comment is the improved Tioga road in Yosemite National Park. There is one very bad cut across glacial pavement, and the road itself for some thousands of people has become a convenient highway. These users find irksome the \$3.00 entrance charge to the park because they are not desiring to enter the park as visitors but merely to use this way across. The lot of such users has been softened by a season ticket at \$7.00. The object lesson remains, that roads, especially through-roads, soon acquire power in their own right and, as amenities of a national park, should be very thoroughly scrutinized as possible deteriorating elements in lands which are to be maintained unimpaired for posterity.

The arrangement of roads at Olympic National Park seems to us close to ideal. Highway 101 nearly encircles the main portion of the park, actually entering the park only for two short stretches, along the south shore of Lake Crescent and along the ocean strip at Kalaloch. No road crosses the main part of the park and only on those two stretches of Highway 101 can a car enter the park at one spot and leave at another. From Highway 101 several spur roads extend to the park boundary and for short distances into the park. Thus there is easy access to all sides of the park, while at the same time the center is preserved wild and remote. This is quite in contrast to the situations in most other national parks. Yellowstone and Yosemite, for example, contain within them elaborate systems of roads which have their most remote parts along their perimeters, doughnuts of wild country with civilized centers.

Road planning would seem to be in the hands of too many makers of decisions. Other arrangements of roads, which we thought to be made wholly and beneficially for the maintenance of national park values, were the one-way loop roads at Cades Cove in the Great Smokies and also in that very fragile habitat, Organ Pipe Cactus National Monument.

The notion of the parkway as it has been made manifest on the Blue Ridge is another American achievement and contribution to world culture. How far will other nations be able to follow the lead? The German autobahn of the '30s was in somewhat the same tradition and the new British motorways are obviously trying to establish themselves without spoliation. Perhaps the new Italian autostrade reach a dignity equal with the American parkways.

Allied to the notion of roads is that of footpaths to points of particular interest in national parks, and such magnificent walks as the Ap-



palachian Trail. Nobody likes black-topped paths on nature trails in what is hopefully thought to be near wilderness, but the human foot in large numbers of pairs is extremely wearing on terrain. Nature has remarkable powers of recovery; indeed, the ecology of natural rehabilitation could be the subject of a valuable textbook, because the vast interplay of plant and animal species and climatic and geological factors is quite inadequately understood.

Let us look once more at Shenandoah and the Great Smokies, country which in the previous 150 years had been subjected to some excruciating land use — subsistence agriculture and logging in a forest country of steep valleys, mostly acid rocks and ample rainfall with kindly temperatures. The establishment of the national parks in this region is in itself a rehabilitative measure if no positive action were taken beyond buying out the claims of subsistence agriculture and logging. Recovery in the circumstances mentioned has been remarkably rapid, although we think the National Park Service has missed a valuable opportunity of recording in detail the course of this enriching change. But, in general, the Service has worked with the natural recovery in its presentation of these properties and the result is immensely satisfying.

Such general natural healing must, nevertheless, be kept in mind as an intricate, varied pattern and not as a machine-precise design from the loom of nature. The camping grounds may grass up again between the seasons of stress and it may be a major occupation to keep back the regeneration from desired open spaces. Forest soil, however, is friable and if it is exposed in certain places and given stress, there is trouble. For example, in Great Smoky Mountains National Park we climbed from 3,200 feet at the trans-mountain road, Route 411, to the Chimney Tops at 4,750 feet, two spiry summits overlooking the valley. A notice warned the public that this was a climb, not a walk. We had not imagined that so steep a trail could go so far without deviation, through great boulders and exposed rhododendron roots, then into hand-to-hand stuff but still straight up, and finally into rock and small rhododendron near the summit, where we found a man carefully lowering himself on a 100-foot rope. This trail will soon be an erosion gully, as the exposed roots of the rhododendrons were promising. A ranger told us later that a more devious way up has been found, but the climb will take three times as long. This is an example where increased use is turning an interesting climb into an ecological hazard for that part of the national park. In fairness to the National Park Service we should say this trail has been made straight by descending climbers cutting the corners.

The Appalachian Trail itself, so grand in conception and achievement, is taking heavy punishment. We allowed ourselves to follow a self-

guided nature trail of three-quarters of a mile in the higher ground in the spirit of uninformed interest, using our eyes and being helped by the excellent printed guide (which Uncle Sam offered at 5 cents, but if we felt we could not afford this sum, we were at liberty to take the folder and would we please replace it in the box on our return. This is a good gesture and we learned later that nickels were plentiful in the collection box). The feet of nature lovers had worn through the moss-covered, spongy forest path to expose the roots of the spruces and balsam firs. The Appalachian Trail crosses this nature trail twice and here we found a trench 12-18 inches deep in the forest floor. Even the purest of nature lovers has physical weight and boots on his feet. Regrettably, we endorse the view that in the absence of any restriction in numbers, portions of the Appalachian Trail will have to be black-topped.

This course was obviously right at Clingman's Dome where, at the summit, the famous and controversial serpentine structure allows the visitor to see afar from 6,643 feet. On this Sunday morning in mid-October a constant stream of visitors, from infants in arms to stout and elderly folk, were climbing the half-mile and 330 feet. One of us was prepared to accept this structure because of the obvious pleasure it gave to so many. Even the most finicky of visitors on other hilltops is not so neurotic as to be offended by the concrete spiral on Clingman's Dome. Should it ever be renewed, could the concrete be dyed dark green or brown rather than being left raw? Our greatest pleasure was in being able to look down on the texture of a summit red spruce forest. It was lovely, marred only by the fall of artificial snow which clung to the branches — the season's crop of Kleenex which had been applied to the noses of the numerous suffering climbers.

At another extreme, as in the high passes of Rocky Mountain National Park, the sparse alpine vegetation which gives so much pleasure to visitors has to be protected. We visited Trail Ridge at 11,680 feet while a nature trail was being used by a bus load of tourists. Black-top paths were obviously effective in guiding people. (Noses and Kleenex were no problem here as the visitors had suffered no exertion before being decanted from their vehicle at this high altitude.)

We would now touch upon a very large problem on which nothing we are likely to say will have much influence, but the problem can scarcely be set down too often, namely, the conduct of areas immediately adjoining national parks and monuments. The magnificent heritage of natural wealth represented by the parks is being endangered by the lack of planning control outside. We had this impressed on us forcibly early in our investigation travelling through Shenandoah along the Skyline Drive and along the Blue Ridge Parkway towards Great Smokies. Shenandoah and

the Blue Ridge Parkway are inspiring examples of public endeavor towards beauty in development. Admittedly, we thought the craze for views was perpetuating too much of the sick upland farming, because land in the possession of the National Park Service is actually being leased back to farmers to keep it grazed. There were several bad stretches of erosion. Nature cries out that this ill-used land should go back to trees. Even on the glorious Shenandoah Skyline Drive there are those who complain it is becoming an alley in the trees. This is mere carping, for in fact numerous viewpoints are kept clear and allow sudden surprises of superb quality.

The pleasure we experienced is emphasized to put our horror in proper perspective when we approached Great Smokies National Park through Maggie Valley. We were really upset by the billboards and signs, the decrepitude of subsistence farming and what it had done to intrinsically beautiful country, and the banal quality of resorts and souvenir trash. Cherokee was shattering, our cup of unhappiness being filled by seeing an Indian feathered from crown to heel sweeping up cigarette ends outside a souvenir shop. To pitchfork a facet of Plains Indian culture into Cherokee is affronting, but for the trappings of chieftanship to be worn by a sweeper-up of cigarette ends was revolting. Soon we were in the park and grateful.

Again, coming into the park from the other side of the mountains through Gatlinburg we experienced all the pressures of vulgar commercialism. This town owes its rise to the designation of the national park but exhibits none of the characteristics. Rather more than a mile of road after leaving Gatlinburg passes through the national park before arrival at the Sugarlands Visitor Center, this road a quiet nave of trees that gave a definite sense of rest. One of us was irresistibly reminded of going from the High Street in Edinburgh on the pagan festival of Hogmanay into the cathedral of St. Giles to hear the New Year service.

Land prices rocket as soon as a national park is designated and there is little or no control of development on the land adjoining the national park. It may be said, indeed, that designation of a park precipitates unsightly development outside. Cherokee and Gatlinburg, Estes Park at Rocky Mountain and White's City at Carlsbad Caverns — these, surely, are misfortunes which the majority of American citizens would wish to prevent. Such communities have so much to offer in the way of service and that not unprofitably, that space trips at 75 cents, waxworks and the bawl of billboards could be dropped. The opposite extreme was apparent in that area of the Blue Ridge Parkway adjoining the Pisgah National Forest. Worn out farms had become summer homes and the proximity of Forest and Parkway would make a prospective purchaser confident that

he would not be swallowed up in piecemeal development. There was an impression of interest and pride in these properties which were no longer remote because of the intervention of the Parkway.

Proper zoning control of areas adjoining national parks may come in due course, but it is probably a long way ahead. The National Park Service is alive to the handicap it suffers in controlling the situation and, in the example of Great Smoky Mountains, is setting a pattern which may well give an excellent temporary solution, but certainly not a radical cure. The Blue Ridge Parkway has now been extended to run to the boundary of Great Smokies at Oconaluftee Visitor Center. Cherokee is left to the southeast for those who want it. The Service is also building a new approach to Sugarlands Visitor Center on the north which will by-pass Gatlinburg, but leave the present avenue into the town as it is for service purposes.

The large problem of development in national parks is inevitable; whatever is done and whoever does it is going to be criticized, probably unfairly. We are very conscious that as outsiders investigating wear and tear and maintenance of pristine landscape and natural communities of plants and animals, it would be so easy to descend into the ranks of unfair critics without any wish or intention to do so. We wish to emphasize once more our immense pride in the achievement of the National Park Service, spiritually and physically. The qualities which brought the achievement to fruition are still there and will continue; it must be remembered, however, that the Service is greatly expanded from earlier days, the national park system is expanded, and above all, the nation's use of the parks has expanded at a greater rate than has either the Service or the area concerned. The course of visitation since 1945 has been of the order of a flash flood, the simile breaking down in the fact that the visitation is no flash after which the terrain will be much as it was before, but a permanent inundation. Government, National Park Service and nation will have to adapt to a new way of life. But this does not mean necessarily that the ideals which brought the national parks into being and the Service to its achievement will have to be relinquished.



Management of Plants and Animals

4

We have indicated in the previous chapter that the human animal is, in a sense, an intruder in the national parks which must be protected from him by careful planning and regulation of use, but what of the animals which live in the parks, and the plants; what are the datum lines that might guide policy in making decisions on preservation of natural communities?

The first uncritical reply might be that it is fundamental in national park thinking that natural communities of plants and animals should be conserved. Of course it is: does not every ranger and naturalist, every museum, every admonishing and educational signboard draw our attention to the need for care? Indeed yes, but through park after park it is inevitable that certain species and groups of species are not quite getting full opportunity to survive. Only two national parks consistently hold wolves, namely, McKinley in Alaska and Isle Royale in Lake Superior. We know that it was not easy to get sanctuary for the wolf in McKinley, but the studies of Adolph Murie published in 1941 had early effect for the benefit of the animal. The wolves in Isle Royale came across the ice one winter and stayed. Their prey is the moose population and Durward Allen has directed a most enlightening protracted study of the relationship of the two species. Six hundred moose and 20 wolves appear to live in balance and we can say that by these two populations being together, the vegetational habitat is conserved. This in itself must mean the conser-

vation of insect communities and other invertebrate relationships. In short, the National Park Service as managers are being saved a lot of trouble, work and thinking.

How different is the great pseudo-wilderness of Yellowstone where the wolf has no place because of down-country filtration into Montana and Wyoming. The result is an elk problem which was analyzed and pointed out in the '30s but which had to wait until the '50s and '60s before action was taken to reduce the elk population to 5,000. One of us had the opportunity to travel in the Yellowstone in 1950 at the time when the aspen groves were wrecks, and the general appearance of these areas was shocking. Our visit in the course of this study was in 1963 when the senior member was impressed by the generally improved look of the park but *the aspen groves had disappeared*: they had been replaced by grasslands which looked neat and tidy. This is how we might have seen it had not one of us not had the longer memory. In truth, allowing the elk in the northern herd to remain at a population of over 12,000 had removed an important species from the ecosystem and Yellowstone was less wilderness than before.

It has been suggested (in the report of the Secretary of the Interior's Advisory Board on Wildlife Management, *op. cit.*) that the national parks should present a "vignette of primitive America" and that "the biotic associations within each park be maintained, or where necessary re-created, as nearly as possible in the condition that prevailed when the area was first visited by the white man". There is a danger that these phrases might be misinterpreted as meaning that the change and progression which are basic to natural conditions must be checked and the parks maintained as static museum exhibits. We should prefer to say that the wilderness character of the parks should be preserved by permitting natural processes to continue (except that no catastrophe could be permitted to lay waste an entire park). In some cases re-creation of an earlier, more primitive, scene may be desirable, but the opportunity for new landscapes and habitats to develop should not be proscribed. The larger parks have room for many differing successional stages, but no area is sufficiently large or sufficiently remote to remain entirely unaltered by the activities of man. In some parks the effect is very slight and little corrective action is needed. For others a semblance of wilderness is possible only with careful and intensive management.

At Yellowstone the National Park Service is saddled with the unpleasant task of killing a large number of elk each year when the animals are on winter range and more or less useless as food. Further, the reduced population will have a better calving rate and the numbers to be killed will remain high. The waste is dreadful but the alternative is not good. We

talked with a member of the Wyoming Outfitters' Association who did not go as far as many of his associates who wished hunting to be allowed. He would like to see elk on the summer range moved eastward by helicopter or by good scouts, into the shooting country of Wyoming, and out of their Yellowstone sanctuary. His thesis is that the Yellowstone herd is being incremented annually by Wyoming elk because of the sanctuary the park provides. Also, he was dead against shooting in January and February and wished all reduction to be by live trapping and the animals to be let loose elsewhere in Wyoming. However, we learned from other sources that Wyoming already has elk problems and that live-trapped elk from Yellowstone are being more or less set down in feed lots until places can be found for them.

Disturbance of the elk on the summer grounds would be a good thing because there are no wolves to do that, but we see no hope of *moving* the elk eastward by helicopter or scouts. A movement of 30 miles would be necessary, far more than could be done in one day between daylight and dark, and if 10 miles were to be done in one day the animals would double back in the night.

Everybody's natural desire for the elk to be killed when they are in full flesh on the high ground does not work out as it does in the Highlands of Scotland. Distances are much greater and the beasts are much heavier. If the elk were shot in September on the summer country it would mean at least twice as many horses going in as elk were shot, because a horse can pack only half a fat elk. Horses, as we have seen, are already a problem in national parks and hundreds of extra pack journeys into the fragile vegetation of the high country would be disastrous. Another factor would be the food carried in for the horses, which would probably result in a lot of annual weeds being sown in the high pastures that had had their ecological stability broken already by the excessive horse passage and grazing.

We talked with Dr. John Craighead, who has done so much work on the grizzly bears in Yellowstone. He would like to see more elk shot and left on the high ground as carrion for bears and any other carnivores and scavengers, but he admits this might create a build-up of grizzlies which would cause further trouble in due course. Our own comment on this would be to say that if there were to be a build-up of the grizzly bear population, they would begin to prey on the elk calves and this might be the best way of keeping the elk population stable. One of us remembers walking the 4,000-6,000-foot mountains in McKinley Park in late May and early June and finding the considerable toll the grizzlies take of caribou calves. The bears hunt the edges of the snow banks where the calves are often lying up in the first day or two after birth. In any case, the grizzly is as much vegetarian as carnivore and our opinion is that a pri-

mary step of shooting on the high ground and leaving the carcasses as carrion could soon indicate trends to follow. A group of marksmen working quietly in the high ground would cause a minimum of disturbance, and supplies could be dropped by helicopter instead of taking up horses.

The question of hunting in national parks has been debated with heat through the years wherever there is an animal population which might grow beyond the safe grazing capacity. So far hunting has been resisted except in Grand Teton where there has been controlled activity of this kind. In fact, public hunting is an extremely inefficient method of thinning a population of, say, deer or elk; sport hunters in general do not like walking very far and still less carrying a carcass out of remote country. Many studies of amateur hunting pressures show this "roadside" quality of the Nimrods. The Chief Naturalist of Yellowstone, answering demands for public hunting to reduce the elk herd, said, "If their ability was equal to that of the 1,002 hunters in Grand Teton, nearly 18,000 hunters would have killed the 5,000 elk, plus 196 illegal moose, 410 illegal elk and 17 men, along with an undetermined number of bears, coyotes, bighorn sheep, antelope, bison, mule deer and horses." The idea is laughable when reduced to this kind of logic, but more detail is needed to make the situation clear.

Other parks have lesser elk problems: in Glacier the Blackfoot Indians are allowed to keep the numbers in check and take the meat, which seems an excellent situation. Rocky Mountain Park has live-trapped surplus animals and crated them to other districts, a temporary measure, we feel, and one which must not be allowed to degenerate so that the elk are like bagged hares in Ireland.

We were alarmed to find the old established privilege of fishing in the national parks being given an odd twist by biologists of the Bureau of Sport Fisheries and Wildlife working on Yellowstone Lake: they alluded to the valuable fishery of the Lake as if it were a commercial asset and we heard questioned the fact that the white pelicans probably extract a catch equal to that extracted by the public. Could the pelicans continue to be allowed so much in view of the sharply rising number of sports fishermen?

Imagine our surprise on learning that the N. P. S. actually did control (a nice euphemism) the Yellowstone pelicans between 1924 and 1931, when the fish hatchery at the Lake was in operation. Fortunately such activity has not been resumed and policy, stated first in the early 1930's and adhered to since, has protected the rights of native predators "to share normally in the benefits of fish culture."

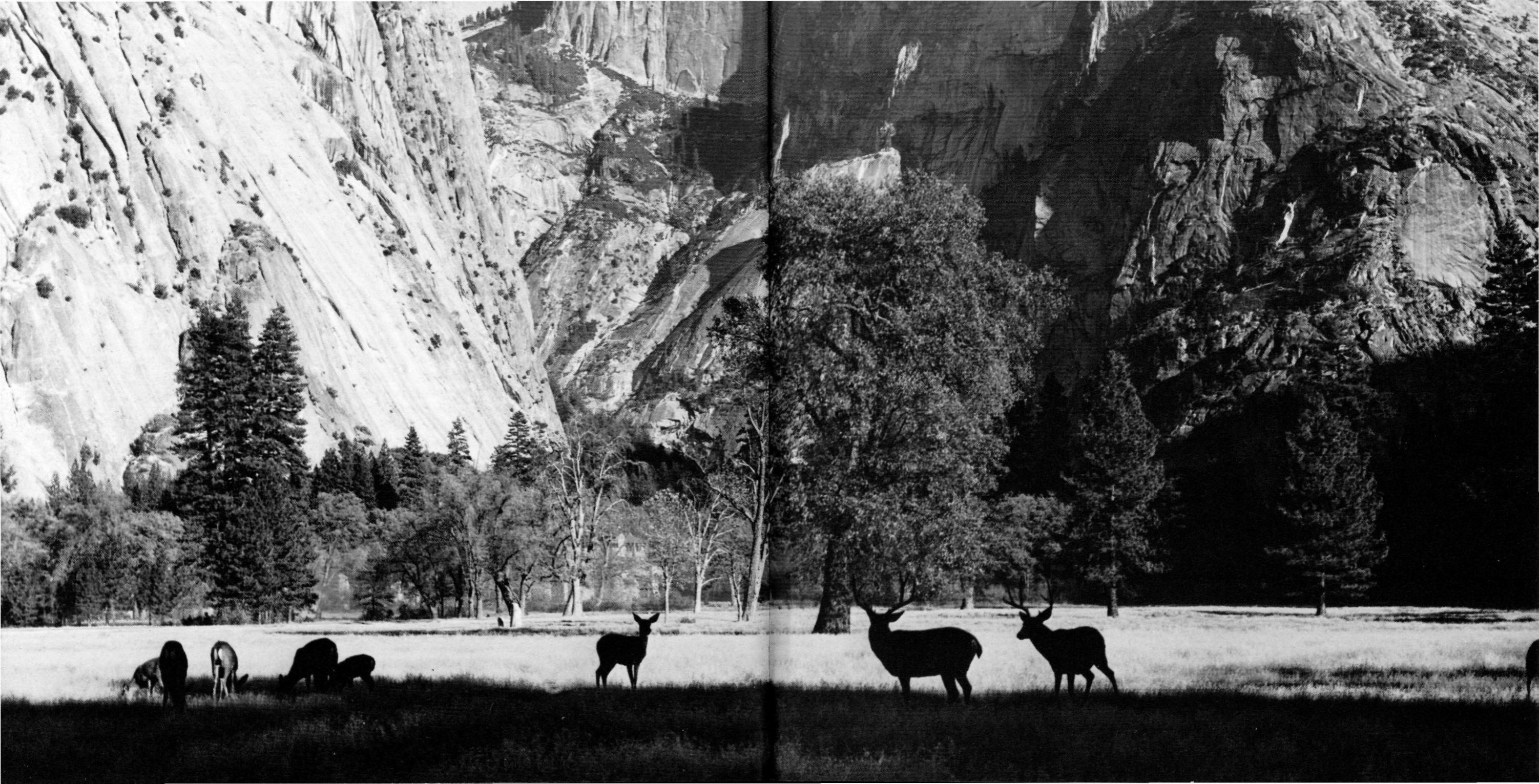
Yellowstone Lake is 88,000 acres in extent and lies at an altitude of 7,700 feet. Its maximum depth is 320 feet. The catch of cut-throat trout in 1925 was 65,000 and in 1959 350,000. There was a fish cultural sta-

tion from 1901 to 1953, when it was discontinued to comply with National Parks Service policy to maintain the cut-throat trout population entirely by natural reproduction. The U.S. Fish and Wildlife Service conducted research on Yellowstone Lake from the early 1940's until 1961, when fishery service investigations were started by the Bureau of Sport Fisheries and Wildlife. These services continue at the direct request of the National Park Service. There is a decline in catch rate and in size, and there is plateauing despite the research. The spawning activity in the 40 tributary streams with a maximum temperature of 60°F. is sufficient to keep the lake going at its present pressure of fishing. Survival rate of young fish seems to be about four-tenths of 1% of the egg potential. The research workers are doing overall population studies, but after questioning, our feeling was that more sublittoral chemical and botanical work was needed.

One might say that the sport fishery on Yellowstone Lake keeps a large number of feet off the land, even if it encourages marinas reminiscent of Long Island Sound. Unfortunately, certain areas around the Lake *do* show damage directly associated with fishermen's activities.

We would put the point of view at this juncture that the privilege of fishing in the national parks is one that needs radical reconsideration. The privilege was given without question at the beginning of national park history: the right to fish with a rod is the almost inalienable right of every American; but again we are up against what was once a perfectly sensible decision being carried forward into a period and circumstances entirely different. This right in our day is of the nature of vestigial remains in evolution. Earlier in national park history a certain amount of living off the country was considered a legitimate part of the park experience. To a limited extent fishing continues in this category today with some campers catching and cooking their suppers. The National Park Service promotion called "Fishing for fun" emphasizes the fact that angling as a sport is completely unrelated to any feeling of man's dependence on nature. This idea seems so foreign to the ethics of the National Park Service as we have known it, that we wonder how it came to be used even while admitting that the intention is to protect fish populations by reducing the kill.

In the past the National Park Service was so philanthropic and unthinking as to follow a policy of stocking remote lakes in fragile country where no sport fish existed formerly. The use of live bait introduced undesirable species, a most unecological procedure in conserving the parks unimpaired. Fortunately, the Service outlawed live bait in the parks many decades ago, but stocking once begun is difficult to stop. Fishermen "collect" remote lakes as status symbols and talking points; they will make great efforts to fish these remote lakes, involving much wear of trails and detrimental treading round lake edges. This is very obvious in the fragile



country of Rocky Mountain National Park at the higher elevations, and we were told that some trails were used almost wholly by fishermen. The extreme paradoxical situation is found at Swamp Lake, at 5,000 feet in Yosemite National Park above Hetch-Hetchy Dam. The damp banks of the lake shore carry species of plants not common anywhere in the west and the lake was designated as a research area to be used for long term ecological research. The lake has been stocked every four years and the very habitat which carries the plants unique to the place is trodden down by the ardent sportsmen catching the few cannibal fish that survive each stocking of a quite unsuitable habitat. The banks of some of the originally barren lakes above 10,000 feet in this park have plant species not found again until the Laurentian Shield is reached and the gneiss lochans of Highland Scotland. Is it sheer ignorance and lack of research which allow these lakes to be stocked?

Fishing, surely, is one of those outworn privileges in a national park of the later 20th century, the more so as so many impoundments of water have been made in many parts of the United States and where fishing is properly encouraged.

Shooting of wild game has long been prohibited in the national parks and the idea is so firmly implanted in the public mind that the proper control of animal populations by the National Park Service has been uncritically resisted until disaster point has been reached. The killing of fish is still something quite different in the public mind, yet if scientists, moralists and esthetes were to sit down together to talk round the subject, they would find it difficult to state logical reasons for treating these various park vertebrates by such different criteria.

Our opinion is that giving sanctuary to the indigenous fish as well as to many other forms of life in the national parks would be a logical development which would have an immediate beneficial effect on the ecological pressures of various kinds we have mentioned. A beginning has been made in a few national parks where some waters formerly open to fishing are now closed because fishing and an overabundance of fishermen were clearly detrimental to scenery, wildlife and vegetation. For example, Bear Lake in Rocky Mountain National Park, and Tipsoo and Reflection Lakes at Mount Rainier, are easily accessible and highly scenic lakes whose shorelines had become badly eroded and unsightly. In other places the fish themselves have received protection, by reducing the limit, as at Yellowstone Lake where the maximum number per day per fisherman is now three; by increasing the minimum length, as at Bush Creek in Kings Canyon National Park; and by prohibiting all fishing.

All lake shores and river basin systems should be protected and the avian fauna depending on the lakes and streams for its food should have

its first right respected. There is the further significant point that many human visitors to the national parks find immense pleasure in the bird life to be seen. Any restriction of it, such as of the white pelicans which appear to be direct competitors with the sport fishermen, would be abhorrent if the restriction were to allow a greater take by the fishermen in a national park. As it stands at present, manipulation by scientific methods of the fish stocks for higher yields is right and proper, but the question put by the Bureau of Sport Fisheries and Wildlife biologists on Yellowstone Lake disturbed us.

At this point we should like to comment on the general problem of exotics without suggesting that we presume to offer solutions. There is a general belief that the presence of exotics in a national park is to be deplored and that is probably sound enough. All the same, the ecology of exotics is quite complex and it is difficult to subscribe to the purist attitude we have heard so often both inside and outside the National Park Service. How many areas are free from exotics? What is and what is not an exotic by this time? Why is an exotic present? What is an exotic doing — good or harm, or both?

Of course, man is the great conveyor of exotics, purposely or accidentally, and everybody knows about rats and mongooses and garden weeds. Remarkably few people know that exotics have difficulty in breaking into a stable climax community, or that in the course of natural succession an exotic appearing, say as an annual weed, at an early stage is unlikely to persist into later and more complex stages of succession. The question of the status of exotics should not cause hysterical reactions until each example is thought through.

For example, we cannot get bothered about broom (*Cytisus scoparius*) in Olympic National Park. Admittedly it is the west coast climate which makes it possible for this plant to go wild, but for the same reason it is unlikely to go very high in the park. It is a leguminous pioneer establishing itself in cleared ground or simplified pioneer ecosystems and stages of succession. Therefore, it is found along roadsides and on clearings in the Olympic Peninsula. The plant helps to stabilize road cuts and fills and its nitrogen-fixing quality prepares the soil for a later stage of succession. The foxglove is another pioneer in damp climates and acid soils and cannot go much further than the landslip areas and some meadows in Mount Rainer National Park. Our opinion is that even if one would prefer to be without these exotics, there is no point in wasting time and money getting rid of them. The appearance and spread of any exotic plant almost axiomatically should cause us to say, "What have we done to this ecosystem that allows this plant to take hold?" It is so often a matter of the mote and the beam.

But what of the goat, that Mephistophelean disastrous exotic which is established almost ineradicably over half the world? It is hurtful to have such hard feelings as we must have for this lovable, humorous, intelligent and persistent creature, but the species is a major problem, not least in national parks. But even here we have had disturbing doubts: our month in the islands of the Hawaiian group was most enlightening to our general education, including contemplation of the goat and its works. We sat along the Hilina Pali trail looking down from about 2,250 feet over the inhospitable lava slopes to a coastal plain west of Halape. Behind us were forests of *Ohia* (*Metrosideros*) which all of us wish to conserve; the coastal strip was green with grass, the miles between were *a-a* lava. As we gazed through binoculars, about 1,000 goats were grazing and resting on the few hundred acres of grass. We grew reflective.

The Hawaiian group of islands is purely volcanic and, being so far from any other islands or continents acquired naturally relatively few plants and animals. The natural communities were simple because Hawaii was hard to reach by floating seeds, spores and so on. Polynesian man colonizing Hawaii possibly 1,200 years ago found very little to sustain him in the forests of tree fern. It would seem that in his wisdom gained by occupancy of so many islands, the Polynesian brought the breadfruit, taro and the yam with him and possibly a score more plants. Hawaii, then, gained some exotics and many others followed, plant and animal. The European discovery of Hawaii in the 1770's was not of a pristine plant and animal community. Introductions of new species were almost the order of the new experimental age. Some grasses had certainly arrived in Hawaii by then, but many new ones came with the Europeans and the weeds of arable land. Captain Cook presented the goats and was doubtless convinced of the benefits of this step.

So here were 1,000 descendants of those exotic goats comfortably ensconced on these few hundred acres of exotic grass. One does not have to be immoderately pure to declare war on the goats which sometimes come up the slopes and attack the fringes of the *Koa* (*Acacia koa*) forest, but to be a logical purist on the matter of exotics, the grass should be pulled up and got rid of as well. Is this likely, or even possible? We think not. To reduce the goats is hard work and is done by having periodic drives in which many men and horses take part and the goats not clever enough find themselves in an enclosure which grows smaller and smaller until the animals can be caught. Several hundred goats and up to 2,000 are captured in these drives of the total population of about 10,000. But these reductions are probably invigorating to the stock and keep up the kidding rate. It remains to be seen whether the goats on the main island of Hawaii can be exterminated in this way. But what of the grass? In the

absence of goats to eat it, the grass will grow long and wither and become a fire hazard to the forest above. Possibly, lacking any better animal (and God forbid the rabbit!) there is an optimum population of goats which would subsist by keeping down the grass without having to go up to the fringes of the forest. If an ecological study supported such a view, the goat in severely pruned numbers in this particular situation would not be an altogether harmful exotic. We found that the State Fish and Game Commission is anxious to conduct such a study but has not been encouraged by the National Park Service.

Let us now move over to the island of Maui where the great caldera of Haleakala lies at around 7,000 feet altitude between peaks of 9,000 and 10,000 feet. It is a superb property of the National Park Service, managed with impeccable restraint for the benefit of the natural communities of plants and animals in the crater. The goat is the enemy and nothing whatever can be said in extenuation of its presence. The leguminous *mamane* tree (*Sophora*) is indigenous and is being bitten back to extinction by the goats which are partial to it. The particular type of *Ohia* is also being attacked. That unique and spectacular plant, the silver-sword (*Argyroxiphium*) is a favorite food of the goats; only the fact that most of the remaining plants are in a part of the crater which leaves the goats without easy retreat into cliffs, has saved them so far.

There could be no driving of goats here in the crater in a habitat of cliffs; it must be steady picking off by shooting. But that would be useless unless infiltration could be stopped and that means a goat-proof fence along the 26 miles of the perimeter. The National Park Service has undertaken this \$75,000 task since our visit and every United States citizen should be grateful. This was a task undertaken solely for the benefit of the silent community of plants, and in the finest tradition of the national parks.

We have already noted our admiration for the National Park Service and system as they were during the 1930's. A particularly promising development of that period was the acceptance by the Service of the recommendations of Messrs. Wright, Dixon and Thompson as published in *National Park Fauna Series Numbers 1 and 2*. The authors of these reports were absorbed into the Service in a new Wildlife Division and a corps of biologists was established. For a few years park development plans had to be approved by the biologists as well as the engineers and landscape architects.

In most essentials the Leopold and Robbins Committees have only restated, 30 years later, the conclusions of Wright, Dixon and Thompson. It seems incredible that such a promising line of management should have been abandoned, particularly since ecological deterioration in many parks



has now progressed so far that it is noticed by even the casual park visitor. We have spoken of what appears to be indecision in many areas of national park management. In the matters of ecological awareness and responsibility there seems to be positive resistance to new ideas, or re-acceptance of old. In Everglades National Park, particularly, this resistance to the biological approach to care and maintenance has been the cause of greater deterioration of the habitats. This park is one of the few having an official biologist in residence. He happens to be an extremely deep-feeling ecologist who has set down, as early as 1962, a clear scholarly appreciation of the ecological spectrum presented by this area of southern Florida. His report was laid aside (the Robbins Committee said "lost") for several months and came to light only when the Robbins Committee visited the Everglades and asked why a statement, of exactly the kind Dr. Robertson had produced, had not been made.

The Robertson statement profoundly influenced the Robbins Committee, and its report (National Academy of Science — National Research Council, 1963) quoted these paragraphs which are repeated below:

"The nationally significant features of Everglades National Park are almost entirely biological, and many aspects of the natural history of the area are still little known. The area is not closely comparable with any other, and research findings in a given field obtained elsewhere are seldom directly applicable. Much of the biology of the area appears to depend upon minute variations in environmental factors and delicate fluctuating balances, between flooding and desiccation and between salt and fresh water. Though vast, the area is not large enough to be in control of its own ecological destiny. Various alien forms of land use around its periphery threaten serious ecological deterioration. Dozens of species of animals and plants are restricted to the area, and, being represented by small populations that occupy limited ranges, are continually under threat from adverse ecological change, natural disaster, and disturbance.

"The above facts combine to make the need for an active program of natural history research particularly acute in Everglades. No phase of park operations can afford to proceed without careful evaluation of possible effects upon natural history values. Construction programs and plans for channeling visitor use have continual need for such information. Interpretation activities require research findings not only to do a proper job of forcefully illustrating difficult concepts by exhibits and other forms of presentation but also in order to broaden and refresh the program continually.

"The present report undertakes to review the natural history fields of greatest importance in Everglades, showing research in progress and presenting project outlines for research that appears to be needed in the next several years. The range of possible worthwhile natural history research in Everglades is so nearly unlimited that it would be futile even to attempt a complete listing. Obviously, our present interest must be concentrated upon the most critical needs, leaving much interesting and valuable biological research of more limited significance for a later day."

Durbin C. Tabb of the Institute of Marine Science of the Univer-

sity of Miami, produced in December, 1963 an impressive *Summary of Existing Information on the Fresh-water, Brackish-water and Marine Ecology of the Florida Everglades Region in Relation to Fresh-water Needs of Everglades National Park*. In his recommendations for research he says:

“There has apparently been a lack of understanding of the need for research in Everglades National Park. It is apparent that emergency situations in areas where large investment is involved are those that have received research funds. The American public has a large investment in the National Park System. In cases where this investment is threatened by forces brought about by man it seems incumbent upon the public to insist that their resources be protected. Everglades Park is unique among national parks in that its character can become permanently altered by man’s efforts in the field of resource exploitation outside the Park boundaries.

“The unique natural features of Everglades National Park are greatly different from the features in the mountain parks. They are subtle and elusive, yet they can lead to understanding on the part of the public of the processes of land formation, the transition from marine to fresh-water life on the part of animals and plants, the immense productivity of coastal waters that act as a depository for the leachings of the land, and many other exciting and stimulating biological phenomena. These features cannot be shown to the public unless research provides clear and precise descriptions.

“Not the least important reason for maintaining the unique character of the park is its value as a natural, undisturbed laboratory where scientific studies can be conducted free from the disruptions of civilization. Such regions are practically non-existent in the United States, and certainly in Florida.

“The National Park Service should resist to the utmost suggestions that water control measures of any magnitude be instituted within the park boundaries.

“It has been remarked that alteration of the park would not be all bad since it might be interesting to see the sequence of change, but it must be pointed out that the national parks were not meant as experimental plots for man to manipulate. There is more than enough change in the unaltered environment to provide research subjects.”

The immense pleasure we gained from our own visit and the excellent popular presentation of the natural history of the park in nature trails and museum must be recorded, but they were obviously overshadowed by concern for the perpetuation of the biological communities and their contributory conditions which prompted designation of the Everglades as a national park. The prestige of the National Park Service as a bureau of the Department of the Interior demands that designation of such an area should not decline into a pessimistic acceptance of biological deterioration. It is, therefore, with profound hopefulness for the future that we find a heavy document coming from the National Park Service in April, 1966, entitled *Everglades National Park Natural Sciences Research Plan*. It is a National Park Service compilation but preparation involved

scientists from several research institutions in Florida, National Park Service biologists and naturalists, and officers of U.S. Geological Survey. It would be difficult for us adequately to express our appreciation of this mimeographed (and therefore not generally distributed) document. The marshalling of the contents is in itself a masterly piece of drafting.

The bare outline of the *Research Plan* is:

CHAPTER I. Purposes and Objectives.

CHAPTER II. Resource Characteristics.

CHAPTER III. Needed Research (in all relevant fields).

CHAPTER IV. Bibliography (over 500 titles).

It is evident that biological thinking in the National Park Service has found new expression, and we can but hope that the same standard of research plan will be compiled for all the many parks which are showing definite signs of ecological deterioration. Indeed, immediately after these remarks were written, a further Natural Sciences Research Plan reached us, dealing with Sequoia and Kings Canyon National Parks. It is of the same high order as the one for Everglades. Dr. George Sprugel's accompanying letter informs us that a further plan for Isle Royale has been prepared, and others for Virgin Islands, Great Smoky Mountains, Carlsbad Caverns and Big Bend are in varying stages of completion.

The foregoing paragraph is one of heartfelt congratulation but not one of henceforth unalloyed optimism. These same biological attitudes and concepts have been expressed before and have received official commendation and approval and still not found their place in existing policy when decisions are made for individual parks. The early conception of the National Park Service was for close overall control of properties by the central agency. Despite the obvious necessity for some proliferation and for more flexibility of action within each park, the need remains for the Service to act as one being, firmly convinced in its policy. The near autonomy of regional offices gives us no confidence.



The Concept of Wilderness in National Parks



Wilderness is another of those words which have suffered some erosion or derogatory change of connotation through the years. The Oxford English Dictionary derives the word from Old English, possibly wild-deer-ness, but the plain definition is wild, uncultivated land, uninhabited by human beings but occupied by the wild animals. Webster says "a tract of land or a region (as a forest or wide barren plain) uncultivated and uninhabited by human beings . . . an empty or pathless area . . . a part of a garden devoted to wild growth". Through history the tendency has been to think of a cultivated place as being better or more acceptable than a wild one; then an untended garden became a wilderness in common parlance; and finally the politicians gathered the word into their fevered vocabulary to signify the state of being out of power. Webster, at least, has lifted the word from an utter abyss by speaking of a part of a garden *devoted* to wild growth.

The word has also kept its nobility for the few and in this day of human crisis we know there is nothing derogatory or outmoded in the notion of wilderness. The dedication of wilderness was a large part of the early national park idea, although but a few could have foreseen a time when little wilderness would remain.

The Wilderness Act of September 3, 1964 was hard fought before it became law and is a true sign of our predicament. The definition here

is practical, a basis from which a Wilderness System can be identified and designated:

“A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this act an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.”

The wilderness we seek to protect in the national parks and forests carries much more than the necessarily bare description of the act. True wilderness has no voice except that drawn forth from the few human beings who have spent their 40 days there and have returned with that which they are unable to tell. Even so, we believe the wild areas we seek to protect have meaning also for the many who will never know them in their physical aspects. There is a wilderness of mind and spirit which those who are called have the courage to enter, dwell there a space and return again; yet our minds and language are so full of simile and metaphor that this intellectual and spiritual wilderness is set about with forests, ocean, desert and mountain; with storm, maelstrom, sunlit glades and far distance. To deprive the globe of physical wilderness would be to give a deep wound to our own kind.

We would say the national park idea in its highest expression is an aspect of true religion, and to have it beset by expediency in our time of need is grievous. All now realize that the national parks cannot be wholly a wilderness system in a modern world, but the national parks of the roads, the museums, visitor centers, campsites and scenic outlooks are in effect a staging point to the wilderness. When we are tempted to turn away, sickened at misuse and apparent non-participation by some types of visitors, let us remember the responsibility of our deep convictions of the true significance of national parks as part of our faith. If we become faint of heart this noble idea is lost.

Many, even most, national parks contain wilderness areas, but at this moment in time they need proclamation and the firm decision to hold them as such. When the Yellowstone was made a national park most of the country around was equally wild. This is so no longer and within the park we see that the true wilderness areas are not at the center but towards

the boundaries, and we cannot but fear, though these areas are something special in our conception of the Yellowstone, not just wild country to walk in but the fiber of the national park itself. The parks are where they are because of these unique wonders which can be sustained only if the general wild quality of the park is respected.

The act instructs the National Park Service and other federal agencies over a period of years to identify parcels of land larger than 5,000 acres which might qualify as wilderness and to evaluate them for inclusion in a wilderness system. No minimum area is specified if it is worth while, even so little as 500 acres. Restriction of use of the parcels of wilderness will be mainly by controlling means of transportation. There will be no roads made into the land and no engines will be allowed, such as tote goats or inboard motors for boats. There will be no flying in. Pack horses are to be allowed, and rather surprisingly there does not seem to be a definite limit put on the size of the trains. No permanent structures will be erected.

The act does not allow itself to be bogged down by any scientific criterion of wilderness, and wisely. In general a wilderness area will appear in essentials to be unaltered by man, but the act recognizes that secondary forest or grassland may still attain to wilderness quality. Happily, elimination of mining is envisaged. Management, so far as it is necessary, will be permitted, but there will be no rules of management. All of this seems to us wise and far-seeing.

Procedure in terms of the instruction of the act seems fairly simple for the Forest Service, but the National Park Service will be in greater difficulty because of its innate philanthropic ethos which, perhaps, the Service does not quite realize is one of its potential weaknesses. Tentative wilderness zoning plans are already in circulation and we wonder whether some of these have been drawn on the basis of wilderness now, or of thinking in terms of zoning for development of visitor facilities in the future.

A decision not to build roads into a wilderness area surely should not mean that when wilderness (in terms of ecosystems) lies athwart an existing road, the boundaries of such a wilderness must go back in half a mile or more. Such a decision would leave wide corridors along roads as areas of potential development not managed as wilderness. Restriction on parking, picnicking or camping along such stretches of existing road would be all that would be required to maintain the roadside corridors as essential wilderness. The National Park Service has given itself another arbitrary limitation, that wilderness should exclude those areas which might be in sight or sound of civilization. All of us might prefer it that way but it could be too harsh a criterion. An island in Florida Bay serving as a nesting site for roseate spoonbills and other water birds could be ex-

cluded for such a reason, whereas, as long as the public does not go ashore, such an island is essentially wilderness.

The criterion of roads in evaluation for wilderness will much affect Great Smoky Mountains National Park. We see from the tentative plan that whereas three-quarters of the park could be wilderness, imposition of arbitrary corridors either side of existing and proposed roads will reduce wilderness to only half of the park. This appears to us an unnecessary penalty to be placed on this magnificent area of natural forest.

We must realize here, of course, that there are the two main calls for wilderness: first, the opportunities for ecosystems of plants and animals to survive; and second, the need of wilderness for the human soul, for thriving, purification and re-creation. The difference between a strict wildlife reserve and wilderness in its mystical aspect may not be easy to set down on paper but the notions should be separate enough in the mind not to let one or other conception exclude an area from being designated and respected as wilderness. It is a primary duty of management of any national park that as much of its area as possible should be wilderness or near wilderness if management is to fulfill the intent of the 1916 act setting up the Service.

We have been impressed by the documents emanating recently from the National Parks Association on the subject of delineation of wilderness. In the principles set forth in the Association's plan for Sequoia-Kings Canyon National Parks appears this statement which could scarcely be more terse and less equivocal:

"Wilderness starts at the road and any buffer to remove the sights or sounds of man should be internal to the boundary of wilderness. Otherwise, new incursions will result in a steadily retreating wilderness."

The President of the Association, Anthony Wayne Smith, has repeatedly emphasized in recent years how wilderness-consuming activities could be removed to the outside of national parks, and how planned deployment of recreational activities in existing publicly-owned lands adjacent or close to the national parks would go far to conserve those unique qualities for which the national park itself was dedicated and of which wilderness is of never-lessening significance. We ourselves have often had the uncomfortable feeling that the philanthropic ethos of the National Park Service has overshadowed the primary necessity to conserve the habitat. Implementation of the Wilderness Act by the Service should strengthen the ecological resistance of the parks to the pressures which beset them, but a misguided leaning towards dichotomy of values in assessments of national park terrain could well hasten decline of habitat rather than prevent it. Such a trend would be an ironical negation of what the Wilderness Act is designed to achieve.

Finally, we would emphasize that the National Park Service Act of 1916 contained all that was necessary to preserve the wilderness quality of the national parks. The interpretation of the act by the National Park Service achieved this end fairly successfully until the end of the Second War, but the inundation of the parks by visitors in the post-war years was not grasped by the authorities for the destructive phenomenon it was. We feel that the eclipse of Newton Drury was a function of this failure in understanding what was happening. The Service as it later reacted to pressures was over-generous with a perishable and shrinking resource and did not act quickly enough in co-ordinating with other agencies to spread the load and to divert fun-seeking recreation to other areas than the national parks. The U.S. Forest Service was, in our opinion, much more politically aware of the trend of the times, as the National Park Service was naive. Mission 66, instead of being a far-sighted planning operation to conserve these choice areas, seems to have been conceived to allow more complete infiltration and uncritical use. We remain somewhat puzzled by — as it seems to us — the unfair political pressures which have been brought to bear on the National Park Service to dilute wilderness quality, e.g., the extravagant utterances concerning motor-boating on Jenny Lake in Grand Teton National Park, and the relative peace with which the Forest Service has been able to conduct its wilderness-preserving and recreational policy.

The national park policies of the 20's and 30's were not adequate in the 50's and 60's, and the National Park Service has not adapted quickly enough to the new situation. Indeed, Mission 66 was in some measure in reverse trend. In singling out wilderness for special protection the 1964 act has certainly forced the National Park Service to reconsider some portions of its management policy, but a restatement of general national park principles in terms of the situation in the 1960's might have been more productive of safeguards for the parks. The present desire of the National Park Service to designate as wilderness only areas of some subjective and probably hypothetical purity is another sample of high-toned fluffy thinking. Nearly all the parks were wilderness in reality or intention at their inception and should be so considered, without drawing imaginary lines of purity within the parks, caused by our intellectual differentiations of wilderness qualities. And effort must be concerted to moving outside the parks those so-called facilities which at present encumber them. Canyon Village in the one-time wilderness of the Yellowstone remains for us the type specimen of misconceived pandering to the less appreciative and more uncritical section of public taste. Surely the responsibility and part function of the National Park Service is to educate for taste and lead it.

In conclusion, we foresee a time of greater realization that in an area of large, mobile, leisured populations, it is a privilege rather than an unheeded right to visit the superb national properties maintained as well as they are by the devoted labor of the National Park Service in the field. Certain forms of decorous behavior should be accepted and not questioned. The National Gallery of Art and the great museums expect and get such behavior within their precincts. The national parks of the United States present the glorious creations of nature and no expediency or misconception of their beauty must endanger the world heritage of which they are so shining a part. Art is but an emanation from the matrix of nature to which we must return always for refreshment and new inspiration.

Postscript

Comments on The Interpretive Goals in The National Parks *

By WILLIAM H. EDDY, JR.

Yosemite National Park represents in essence the basic conflicts which exist today and will exist in the near future in many of the natural areas administered by the National Park Service. Basically this is the conflict between the new and the old. New people with new affluence, new leisure, new mobility, and new interests — all are making their demands on the old and limited environments of fragile natural areas. That these demands will have to be met in the very near future places a heavy burden on those people who must determine and define the role of national parks in the total American environment. The relatively recent delineation of recreation areas, historic sites, national parks, and wilderness areas, reflects the effort by the Park Service to cope with increasing pressures of different kinds on different areas. It is evident, however, especially at Yosemite and even Yellowstone, that there is increasing confusion as to the distinction between a recreational facility and a national park.

The motto engraved on the Theodore Roosevelt Arch at the north entrance to Yellowstone has become today the embodiment of this confusion — “For The Benefit And The Enjoyment Of The People.” Obviously, at the time of its creation this concept meant something quite different from what it means today. For under the category of benefits

* — Preliminary report submitted to the National Park Service by the Foundation as part of a project being carried out under contract with the Service.

come such things today as trailer campsites with water facilities, sewage outlets, and electrical connections — and hotels, shops, grocery stores, medical facilities, cocktail lounges and restaurants. In other words, the concept of benefits to be found in a national park has come more and more to mean physical utilities and services.

Under the category of enjoyment today comes not only boating, swimming, fishing, hiking and game viewing, but also movies, magicians, professional singers and musicians — and even a firefall. Thus the concept of enjoyment today has come more and more to mean mere entertainment.

The argument for all of this, of course, is that national parks in a rapidly changing world must adapt to meet the increased variety of demands of visitors. While such an argument may have been valid when population pressures were more limited, that argument projected into the near future and carried to its logical conclusion, leads only down a one-way street to a dead end. Already there are clear signs at Yosemite that in order to provide for today's concept of the benefit and enjoyment of increasing numbers of people, not only is the natural environment itself being destroyed, but the purpose and role of the national park is becoming less and less clear.

The two elements in this conflict must be separated. The varied demands for public recreation and entertainment must be met in a variety of ways and in a variety of places from Lake Powell to Disneyland. Of equal validity but for very different reasons is the desirability of setting aside some of the fragile and unique areas in America for clearly defined public use. There is a real question, however, as to whether these two differing elements can live together very long in the same environment without one threatening the existence of the other.

We believe that this conflict cannot best be solved only by arbitrary decision or by legislation, but by the more gradual process of educating the visitors and redefining the image of the national parks. In this process of shaping the future of parks we believe the interpretive division can and should play a major role.

One of the first steps in the process of redefining their image is to move away from the connotation that parks are primarily museums of natural curiosities — that they are antique shops where one can find the oldest, the biggest, the tallest, the smallest, or the only of any particular natural object. Such an image connotes a fragmented, static series of things rather than a dynamic, viable whole. Even the prevalent description of the national parks as “vignettes of primitive America” is basically a static image, suggesting an object that is being preserved as it is by putting boundaries around it.

The real need, in our judgment, is for the visitors to see the parks as part of a total process in which they and their own urban communities are included.

To meet this need for redefining the image of parks, the interpretive division itself is deeply involved in reevaluating its own approach to education.

The so-called traditional approach as it still exists in the parks we visited is in basic conflict with the need for programs and materials designed to reach an ever-increasing number of urban Americans. This approach is usually informational in content and deals with a specific body of fact about some particular aspect of a particular park. With some outstanding exceptions, the subject is presented without any meaningful reference to the environment from which the visitor comes and in which he lives for 50 weeks of the year. As a result, whether about today's wildlife or yesterday's glacial polishing, the individual facts float in a hazy limbo isolated in time and space from any world the visitor knows. Such programs may be enthusiastically and accurately presented, and even may be of immediate interest to the visitor. Too often, however, he carries away only fragmented and unrelated bits of information much as one collects historical or natural oddities.

In our judgment this approach may be effective and useful for visitors who specifically seek out information as part of an increased understanding of what constitutes something we might call "the national park experience." Such people know why they are there.

It is a questionable approach, however, to use with masses of rapidly mobile families who come to a park to add it to a list of things done last summer, to use the area as an inexpensive camping spot on their way to someplace else, or as apparently even more common at Yosemite, simply to get out of Los Angeles for the weekend.

Recently, many good efforts have been made to reshape the purely informational programs into a more cohesive and meaningful whole. By introducing visitors to an organizing concept such as ecology, even a moderately skillful interpreter can relate a series of apparently disparate facts. The problem is that only the rare interpreter carries such concepts beyond the park boundaries.

We believe that with the growing concern about environment and natural beauty in America the parks have an unprecedented opportunity to shape public attitudes toward environment. The first step is to use the interpretive program to build a bridge between the world of the park and the world of the visitor — to demonstrate at a variety of levels that the forces that shape and control natural communities are precisely those forces that man has unleashed and accelerated in shaping his own com-

munities. From such a conceptual bridge the visitor can view the park, his home and himself with perspective he has never had before. In that new perspective lies the possibility of a different attitude toward environment.

At Yosemite the tremendous weekend influx of visitors from Los Angeles seeking recreation and entertainment is as much a commentary about the limitations of the environment of Los Angeles as it is about the attractions of Yosemite. That park has not as yet tried to turn this very problem into an educational opportunity. Not until they recognize their responsibility to do so can the tremendous educational potential of Yosemite become a major influence in shaping the recreational planning so needed in the urban areas such as Los Angeles. Such an effort would not only be an important step by parks in trying to solve some of their present problems, but it would also be a starting point for a definition of parks as a major educational force.

We believe that as the parks begin to see themselves in this new role a variety of doors can open. Carefully selected permanent staff might well become involved at staggered intervals as advisors to urban planning commissions, using their unique and detailed knowledge of the very recreational demands that threaten to dominate so many of the natural areas today. Recognizing the validity of these demands and helping to plan wisely for them outside of the park can begin to release those areas inside for a qualitative educational experience of a different kind for a different people. Seasonal rangers too, many of whom are teachers, might have a vital function in helping educate their own communities to what parks are and what they are not, to help the young people in schools and youth groups to understand the nature of a park experience.

Thus shaping public attitudes toward urban problems and even assisting in their solution is inextricably tied with building attitudes toward parks themselves. For it is the people who can and must be led to understand that much of what they seek in parks can be provided well in other places — that parks are special. It is the interpretive division of the National Park Service and no one else who can and must lead them to this awareness.

Obviously such changes cannot occur overnight. They involve a process, an approach that evolves from a decision at all levels of administration to move in a particular direction for a period of time. Unfortunately it is time that is running out, and if what we saw and heard this summer is any indication the crisis is no longer a quiet one.

Postscript to the Second Edition

By WILLIAM H. EDDY, JR.

Since the publication a year and a half ago of the postscript to *Man and Nature in the National Parks*, a number of changes have occurred which warrant comment in this second edition.

Throughout the National Park Service in the last 18 months there has been a major re-evaluation of direction and purpose. This has manifested itself in a variety of ways, symbolized best perhaps by the decision to terminate the firefall at Yosemite. This assault on national park "tradition" was a clear effort to redefine the image of parks by focussing on the particular event that had come to characterize so much of the system. It was a shift from entertainment and emphasis on spectacle to a more urgent concern with the whole environment.

At approximately the same time, the National Park Service set aside funds to establish a national environmental education division aimed at shaping school curricula throughout the country to include materials on a variety of environmental issues.

Within the National Park Service itself, the staff of the Stephen T. Mather Interpretive Training and Research Center at Harper's Ferry has been conducting a series of training sessions for all levels of park personnel. While such training is not in itself new, it is pertinent that the focus over the past two years has been on "environmental awareness." Population growth, urban sprawl, water and air pollution, worldwide ecological

problems—all are considered directly relevant to the Service's interpretive goals. Scores of Park Service people from historic sites, national monuments, recreation areas, national parks, and regional offices have been exposed to this approach.

Direct experience with these training programs and with the people involved suggests that an important change is taking place in the role that the Park Service sees for itself in shaping public attitudes toward environment.

Credit for this re-evaluation of responsibilities goes not only to the director of the National Park Service, George Hartzog, and his assistants, but to the lesser known though equally committed people in the field. Their responsiveness to this new and broader role for parks is a source of real encouragement.

In short, over a period of 18 months the Park Service has gone a long way toward putting its own house in order, in experimenting with new approaches to interpretation, and in seeking outside help and criticism. Certainly one might take issue with this or that park's interpretive program, or with a particular plan for road construction. That will always be so. The point is that within the Park Service there is a gathering momentum, a feeling of vitality, and it is headed in a direction that is right for the parks and for the visitors because it is concerned primarily with environmental quality.

The haunting question is whether this momentum will be effective in coping with the mounting pressures on national parks from outside their boundaries.

There is, for instance, the question of how to structure a meaningful interpretive program for the Everglades National Park. What was only a few years ago a unique part of the American environment has now reached a point where its best use is as an object lesson to show the effect of man's interference with the environment outside a park. Pesticides have and are continuing to sterilize unusual species of birds. The dwindling water supply, because of human demands outside the park, threatens to destroy innumerable forms of life and change the entire ecology of the area.

For the Park Service to seriously consider using one of its own areas to illustrate man's destruction to that environment by his demands on the surrounding land is a sad commentary. At best it is the only honest alternative to communicating a richness and diversity that is now virtually lost.

Similarly, Acadia National Park was faced recently with the threat of an aluminum processing plant and a nuclear generator to be built as part of an industrial park in the immediate vicinity of Mt. Desert Island. Responsible opinion was that the effluents from the plant would seri-

ously damage nearby vegetation, and that the probable increase of water temperature from the nuclear generator would radically affect marine ecology. Out of the approximately 225 registered voters in the small Maine community, 150 defeated a bond issue to finance the proposed project. The nearby National Park waited, without recourse, for the outcome.

Undoubtedly there are other and equally graphic illustrations of this problem to be found elsewhere in the country. The point is that we are witnessing an increasing threat to our national parks that comes from outside the area of their authority and control, and which dramatically affects not only their immediate interests but their very existence.

The deterioration of much of our natural environment in the pursuit of "higher priorities" has occurred with such frequency in recent history that we are in danger of accepting such losses as inevitable. What has happened to the Everglades was certainly predictable. It need not have been inevitable.

In the past 18 months the Park Service has made a commitment to environmental quality within those areas for which it is responsible. Whether it can successfully pursue this course will depend on our own willingness as a people to make a similar commitment to the American environment as a whole.

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