

# NATIONAL PARKS— A WORLD NEED

Compiled and Edited  
by  
Victor H. Cabalane



1962

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NEW YORK, N. Y.

# INTERNATIONAL WILD LIFE PROTECTION

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# NATIONAL PARKS — A WORLD NEED

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## Foreword

*N*ational parks contribute to the inspiration, culture and welfare of mankind and are valuable for economic and scientific reasons and as areas for the future preservation of fauna and flora and geologic structures in their natural state. Such was the wording used by the ECOSOC Council of the United Nations at their 1959 meeting in Mexico City, in the preamble to a resolution calling for the establishment of a United Nations list of National Parks and Equivalent Reserves. Subsequently the U. N. Secretariat asked the International Union for the Conservation of Nature and Natural Resources, which had originally proposed the establishment of such a list in 1958 at their 6th General Assembly in the open amphitheatre of the historic temple at Delphi, Greece, to play a leading role in its preparation. Over the past year and a half, the Secretariat of the U. N. has received reports from 80 governments listing their parks and reserves. This worldwide interest combined with requests for assistance led the IUCN to sponsor the First World Conference on National Parks. The meeting is to be held in Seattle in the summer of 1962, in association with the U. S. National Park Service and the Natural Resources Council of America, both serving as host institutions.

In view of these developments it is particularly timely and appropriate that the American Committee for International Wild Life Protection should have the opportunity of presenting in the following pages the views of thirteen well known conservationists from eleven nations on six continents concerning the need for and uses of national parks. While the key section of the U. S. National Parks Act states in part that the fundamental purpose of the U. S. National Parks and Monuments "is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations," the authors in this volume who have responded to Victor Cahalane's invitation differ widely in their own definitions of national parks, and in the use programs which they advocate for parks. There is, however, general agreement that national parks are increasingly necessary and valuable, and that they are a source of national pride wherever they exist.

In reviewing international action to obtain a true perspective in dealing with the subject of national parks, special credit must be given to the far reaching effects of the 1933 London Convention for the Protection of African Fauna and Flora. This Treaty stimulated conservation programs in many parts of Africa, as well as in other continents. Likewise, the 1942 Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere which has been ratified by twelve American Republics. Many Governments in Africa and Latin America have established legislation for administering

national parks and reserves based on the definitions and enforcing the objectives set forth in these two important treaties, which are currently in force for all ratifying governments.

On behalf of the American Committee for International Wild Life Protection, which is now in its thirty-second year of contributing to the furtherance of conservation on a world-wide basis, I wish to express our gratitude to Victor H. Cahalane, Vice Chairman of the Committee, for having compiled and edited this Volume. His lifelong experience as a biologist with the U. S. National Park Service, combined with his well known writings in the field of natural history, have particularly qualified him to deal with this timely subject in a way that will give us an international perspective on what the national park concept means to other countries.

I likewise wish to acknowledge our indebtedness to an anonymous donor whose encouragement and support made this publication possible, and for translation help given by Mrs. Catherine E. La Rosa of Albany, and the late Dr. Roy E. Mosher of Slingerlands, New York.

In the memorable words of Trevelyan, "The need to preserve natural beauty is not merely a question of preserving pleasuring grounds for masses of people from the town. It is also a matter of preserving a main source of spiritual well-being and inspiration." It is my hope that this publication will help encourage all countries of the world of the urgent necessity for the establishment and the maintenance of national parks or equivalent reserves as part of their own national heritage, to be maintained unimpaired for the benefit of future generations of mankind. Absolute spiritual values that are firmly implanted in our own national park concept are fundamentally concepts of reverence which I am confident can contribute to the furtherance of peace throughout the world.

HAROLD J. COOLIDGE, *Chairman*  
American Committee for International  
Wild Life Protection  
IUCN International Commission on  
National Parks

February 6, 1962

# National Parks — A World Need

## Introduction

by VICTOR H. CAHALANE

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WILDLAND PARKS go back a long way in human history. Small "parks" of highly modified forest were set aside many centuries ago in eastern China for the display and propagation of hooved mammals. Thanks to this specialized land use, we still have a few herds of Pere David's deer, which in the wild stage has been long extinct. In medieval Europe, parks — sometimes of large size — were a recognized institution. Because they were primarily hunting reserves for the privileged few where grazing and wood-cutting were strictly limited, these areas helped to perpetuate some measure of wilderness. Outside of these parks, because practically all arable land was cultivated intensively, most original forms of wildlife were eradicated.

It was not until the mid-nineteenth century that the concept of national parks, as we use the term, became established. The honor of being the first national park is claimed by both Yosemite and Yellowstone, but the fine points of this controversy and of history need not concern us here. Much more important is the fact that, in less than a century, the national park idea has spread around the world. Every continent now has national parks.

Under different nationalities and cultures the term "national parks" has acquired some diversity of meaning. In Switzerland, the Congo Republic and French West Africa, national parks are relatively extensive in relation to the size of the country and were founded primarily as field laboratories for research on natural resources. Recreational use of the visiting public is definitely secondary or even non-existent. Visitors, if permitted at all, are restricted to established travel routes or to comparatively small portions of the total area. Regulation of the few types of tourist activities is (or has been until recently) strictly enforced. Many of the parks in Africa (for example, those of Tanganyika and the Union of South Africa) are primarily wildlife sanctuaries; their scenic value is secondary. Public use here is limited to observing the animals, usually from the safety of automobiles on designated routes of travel. Because of danger from some types of mammals (elephant, lion) no foot travel by visitors is permitted.

In North and Central America, most national parks were chosen for their superlative scenic qualities — high mountains; vast, colorful canyons; forests of gigantic trees, and spectacular evidences of volcanism, erosion by water or ice, or of other natural forces. The areas are mostly extensive, largely or entirely wild, and little marred by industry. If not already in public ownership, the land is acquired by the government, and permanent human residence is terminated. Access roads for motor vehicles are provided to the most scenic points. Tourist accommodations are established and visitation by large numbers of people is encouraged. Except for some utilization of natural resources in the Central American parks, protection of forests, wildlife (except fish), water features and minerals is practically complete. Grazing of domestic stock may be permitted but the goal is to exclude this adverse use and protect even the shrubs and herbs.

This wilderness type of park in which nature is given a high degree of protection is feasible only in regions where economic pressure on the land is not great. In contrast with Canada, the United States, Mexico and Australia, such countries as Great Britain and Japan have relatively little land which has not already been put to productive use. In these densely populated, highly developed regions, a modified form of national parks has evolved. (See pages 39-40, 61-64.) Instead of copying the New World model of a large-scale, government-owned wilderness, Britain and Japan have sought to reconcile modern man and Nature in *joint* occupation of outstanding scenic areas and to secure the right of access of the public to uncultivated portions of them. No land passes from private into public ownership. Private industry is not curtailed. Public visitation to the parks is encouraged and, in some of the Japanese parks near the larger cities, is enormous. Afforestation and some harvesting of trees may be practiced. The objective of management is to safeguard areas of exceptional natural value against spoliation and disorderly development and to improve access of people, chiefly by non-motorized means, to scenes of natural beauty.

The allegation is often made that national parks are single-use areas and, therefore, of limited benefit. Forests cannot be logged, wildlife must not be killed for sport, meat or fur, and even minerals under the ground usually may not be mined. But, are resources of national parks actually "locked up"?

In the following pages of this book, thirteen distinguished authorities from eleven countries have, directly or indirectly, answered the charge. By excluding consuming uses, national parks actually extend the usefulness of scenery, forests, wildlife and other resources over a long period of time. By making the trees, animals, waterfalls and scenery available for the enjoyment of all comers generation after generation, parks become a resource-sharing device.

No, national parks are not limited to a single use. Actually, they are multiple-use areas in the true sense of the term.

First, let us consider soil erosion which results from unwise removal of vegetation, particularly on steep slopes. This has become a world-wide problem. Not only are watersheds lost, the mountains gullied and the return

of forest cover retarded or prevented, but soil, rock and other debris is swept to the lowlands. There the material blocks streams, fills reservoirs and irrigation ditches, and is deposited on arable land making it unfit for cultivation.

Any form of land use that preserves the plant cover on "protection watersheds" is valuable to all inhabitants of the valleys below. In national parks, forests and grasslands are protected; the mulch accumulates to its maximum thickness, acting as a vast sponge to hold the greatest possible amount of water. This flows gradually but constantly downhill as a pure, clear fluid instead of rushing headlong in a silt-laden, destructive torrent that, in dry seasons, is reduced to a trickle.

Secondly, national parks are wildlife sanctuaries. They are often instrumental in saving rare and vanishing species from extinction, and they also serve as reservoirs for replenishing the supply of game in surrounding regions. The nature reserves of the Soviet Union, for example, are sources for animals which are live-trapped and transplanted to distant areas where the species had been extirpated. (See page 68.) If the parks are carefully located with respect to the seasonal movements of the wildlife, the latter may have protection through critical periods (for example, during birth and development of the young). Later, when the animals move out of the sanctuaries, they may be trapped for fur or hunted for sport and meat. In this manner, some African, Russian and American parks are important sources of game such as antelopes and deer, respectively. Some countries also permit the removal of animals within the parks when, because of lack of natural controls, they become so over-abundant as to endanger their food supply. The meat of these surplus animals then becomes available for human use, which can be important in protein-short areas of the world.

Such regulation or management of wildlife populations, as well as designation of sanctuary areas, requires the specialized knowledge of trained biologists in order to safeguard the breeding stock and the range. Also, great care must be taken to avoid disruption of natural processes and modification of the animals' habits, for these are essential and distinctive features of national parks.

This brings us to a third field in multiple use. Only by understanding natural laws which govern soils, plants and animals and their interrelationships can man devise the best methods of land management, agriculture, animal husbandry and other arts. National parks provide the extensive outdoor laboratories which are required for this type of research. Frequently, in highly developed countries, parks are the only areas where the interactions of native plants and animals can be studied under natural conditions. In fields of pure science, parks are ideal for ecological research such as the study of natural and of sexual selection in animals, of emergent evolution, of population fluctuations resulting from competition, immunity, disease, sunspots, weather and radiation, and of many other problems and theories. In applied science, parks are ideal check areas against which to measure the effects of

agricultural and grazing methods on lands elsewhere. For example, samples of normal grasslands (i.e., those in national parks) are useful as standards against which to compare the divergence and recovery, under different handling methods, of ranges which have been subjected to intensive and destructive use. Switzerland is an example of a country which, despite heavy demands on its land, has set aside a relatively large park for the primary purpose of research on natural resources. (See pages 72-74.) The Soviet Union regards its nature reserves as outdoor laboratories where resident and visiting scientists carry on studies of many important problems. (See pages 69-70.)

While it may not be possible to write a price tag for recreation, logical and convincing financial arguments can be made for a fourth use of national parks — economic stimulus. Travel to and use of these areas by the public means that money is poured into the economy. Beyond question, the establishment of national parks in North America, Europe and numerous countries of Africa has greatly increased travel by both residents and foreigners. More persons take vacations because parks are available. People spend money for transportation and living expenses between their homes and the vacation spots, for hotels and meals or for camping equipment and food while in the areas. Numerous other items are purchased such as special outdoor clothing, fishing tackle, photographic apparatus and personal supplies. Some of these expenditures are made along the way in the regions traversed, but most of the spending is in or near the parks themselves. Because most parks are in wild or thinly settled regions, spending for this type of recreation tends to be important economically because it stimulates the growth of under-developed areas. Thus the parks aid in leveling and stabilizing the economy of a country by transferring money from more prosperous, urban centers to less developed regions.

While much of this tourist trade is directed to private industry and small businesses, particularly in the vicinity of the parks, big business also shares in the benefits. Stimulus is given to many different types of concerns, from airlines and automobile and trailer manufacturers to construction companies which build the highways and hotels required by the tourists. Surveys made in some American national parks show almost astronomical figures in economic benefits — the direct result of the existence of these areas.

It is easy to assess the worth of national parks in terms of protected scenery, wildlife, and watersheds, wild game harvests, research findings and tourist spending. But there is still another value which, although it cannot be expressed in terms of money, is nevertheless real and demonstrable. It is the aesthetic and spiritual value of wild places, which are best preserved in national parks. This special quality has been described in glowing prose by Mr. Olson on pages 89-94.

Without exception, the nations of the world are becoming more mechanized and industrialized. With increasing population, cities are expanding and becoming denser. The effect on people is ever more pronounced and is manifest in a growing complex of physical and mental ills. Mankind is too

close to its wilderness origins to withstand this crowding, noise and mechanization without at least occasional release in space and quiet. Every week-end finds the park areas of Europe, Asia and America invaded by thousands of nerve-racked people who have fled from the cities. During every vacation period, the wildernesses of most of the continents are the refuge of many persons, young and old, who are renewing themselves by living an outdoor life. As people everywhere attain a better economic level and are able to afford more than the bare necessities of life, they seek a first-hand understanding of nature. This need for knowing the outdoors — forests, plains, streams, even storms — as our forefathers knew them is never extinguished.

On most of the continents, silence and wilderness can still be found in many places outside of the parks, but they can be assured for the centuries ahead solely in national parks. Eventually, these areas will be the only places where the public at large can find solitude and have the right to enjoy and be inspired by natural, unmarred scenery.

# National Parks in East Africa

by MERVYN COWIE

*Director, Royal National Parks of Kenya*

AFRICA IS A vast continent with a great variety of scenery, climate, vegetation, and people. It is a land of astonishing extremes—from the primitive to the civilized; from deserts to paradise; and from tropical forests to snow-capped mountains. In the equatorial belt, each thousand feet of elevation above sea level causes remarkable changes in temperature and vegetation. One can swelter at the coast or freeze in the highlands, and yet throughout most zones of East Africa wild animals are to be found in greater or lesser numbers.

Much of the central part of Africa is only just emerging from the Dark Ages. Evolution has barely touched the primitive people who have slumbered almost unchanged for thousands of years. In this primitive scene man and beast have co-existed and, although generally at war with each other, have remained in a crude state of balance.

The impact of European civilization has caused an upheaval in the peaceful valleys of Dark Africa, and there are few parts now remaining where the aeroplane, the jeep, the hunter, the prospector, and even the farmer, have failed to penetrate. Roads and railways are spreading across this great domain. Cities and farms nestle where elephants used to roam. Man as a new kind of greedy, destructive animal, has taken over control without realizing that he is in danger of destroying his habitat.

Plunder of natural resources is not peculiar to Africa, but its effects are perhaps very much more pronounced than in more temperate and fertile countries. Much of the northern and tropical part of Africa is a harsh semi-arid land, incapable of supporting intensive human development or agriculture and only suitable perhaps for the herds of wild animals which have survived through the ages. As this new kind of man spreads his activities across these natural sanctuaries, wild creatures are being forced into a more precarious existence, fraught with greater hazards. Thus, we must stop and think; we must take stock of the situation. We must save whatever is valuable, useful and pleasing in the natural scene before it is too late. This is the case for preservation.

Wise men in control of every new country must at some stage assess how best to apportion the available land. Some must be allocated to agriculture and animal husbandry; some must be used for towns and factories; some must be kept to supply timber and firewood and, above all, essential parts

must be kept as water catchment areas and for protection of natural resources. It is in this last category that the National Parks fit.

It was not until after the "Hitler War" (World War II) that East Africa effectively attempted to set aside areas for the total protection of wildlife. It was then not possible to have a free choice since the scramble for land, due to increased populations, had already developed. The Belgian Congo and the Union of South Africa were far-seeing enough to establish National Parks in the early part of this century, but the British territories in East Africa moved more slowly to the recognition that wildlife was a valuable resource and was in danger of destruction.

The greatest impetus in the creation of fully protected areas came from an International Convention held in London in 1933. The inspired people who attended this Conference designed what are still accepted as the basic rules for preservation. A National Park was defined as being an area

- "(a) placed under public control, the boundaries of which shall not be altered or any portion be capable of alienation except by the competent legislative authority.
- "(b) set aside for the propagation, protection and preservation of wild animal life and wild vegetation and for the preservation of objects of aesthetic, geological, prehistoric, historical, archaeological or other scientific interest, for the benefit, advantage and enjoyment of the general public.
- "(c) in which the hunting, killing or capturing of fauna and the destruction or collection of flora is prohibited except by or under the direction and control of the Park authorities.

"In accordance with the above provisions, facilities shall, so far as is possible, be given to the general public for observing the fauna and flora of the National Parks."

In the British territories of East Africa every endeavor has been made to establish National Parks in accordance with this definition, from which it is clear that the primary obligation of the authorities in charge of such National Parks is preservation. The secondary obligation, although undoubtedly the popular reason for their creation, is to provide facilities for the general public to observe the fauna and flora of the National Parks. These two duties are inherently incompatible, since wherever man treads he destroys. The authorities charged with the administration of National Parks therefore have the difficult task of achieving a successful compromise. This leads to a choice in the form of authority to be appointed and in the manner in which these duties should be interpreted.

Countries in Africa have adopted different methods, the choice of which is generally dictated by political, economic and other factors which in themselves vary widely in each part of Africa.

The same London Convention also defined a Strict Natural Reserve as being any area placed under public control throughout which any form of hunting or fishing, any undertaking connected with forestry, agriculture, or mining, any excavations or prospecting, drilling, levelling of the ground, or configuration of the soil or the character of vegetation, any act likely to harm or disturb the fauna or flora, whether indigenous or imported, wild or domesticated, shall be strictly forbidden; which it shall be forbidden to enter, traverse or camp in, without a special written permit from the competent authorities, and in which scientific investigations may only be undertaken by permission of those authorities.

Only in the Belgian Congo has there been any achievement towards the establishment of large Strict Natural Reserves, although in other countries effective endeavors have been made to set aside portions of National Parks as wildlife sanctuaries and as undisturbed breeding areas for the natural flora and fauna.

It is perhaps unfortunate that although in Kenya attempts were made to establish National Parks many years ago, plans for so doing did not reach finality until 1939 and were interrupted by a World War. Tanganyika declared the Serengeti to be a National Park in 1940, under the existing Game Ordinance, but the legislation and the methods of administration did not comply with the definitions of the London Convention, and it was virtually a National Park only in name. Kenya established its first National Park in 1946, and new legislation for Tanganyika made it possible to re-establish the Serengeti as a fully fledged National Park in 1948. Uganda also achieved similar progress, and there are now at least nine National Parks in East Africa, supported by a number of other areas in which the protection of fauna and flora—although in a lesser degree—is the objective.

The London Convention outlined what may be regarded as the ideal, and each respective Government has of necessity to apply these principles in different ways, adjusted to suit the conditions and opportunities of each area. The object remains unchallenged, however, and that is to safeguard some of Nature's bounty for the benefit and enjoyment of all people, whether of this generation or of those who come after.

This poses the question—why preserve wildlife at all? Why set aside land and money for safeguarding animals and vegetation for some purpose which many people find obscure? Do we protect wild creatures for some sentimental reason, or to satisfy our pride and vanity, or smugly to appease our conscience because we are sorry for them? Do we protect glimpses of the natural scene because we are afraid of some penalty to be imposed by a wrathful Creator? Do we pander blindly to a popular concept that civilized man, in order to qualify as such, must turn due attention to aesthetics?

Better, I think, to avoid a welter of ballyhoo and sentimental tosh, and face realities. Let us understand and accept that wild animals, from the

large pachyderms to the minute invertebrates, are Nature's agents employed to take care of the land. Unless unduly restricted or upset by man, wild creatures seldom damage or destroy their own habitat. Each living organism has its part to play in a vital conversion cycle—soil to vegetation and back to soil; rain to the earth, and back to rain. Without the plant cover on the land, the whole process of life would become dormant. Any major interference with any of the natural agencies inevitably causes a disastrous upheaval in the habitat, and who then suffers? We do. Destroy a forest, destroy a thousand elephants, destroy all the invertebrates beneath the soil, and what happens? Vegetation disappears, rivers dry up, rain fails, and the deserts move in. We humans blindly believe that exotic livestock can survive on poor land, or that timber is more valuable than water, or that crops are more valuable than soil. But we ignore the basic fact that the land is man's fundamental resource. How he uses it is his decision; he has been given this dominion.

Thus wildlife preservation is not to satisfy the whims of a bunch of fanatics. It is a vital evolving process in which the land on which we depend is safeguarded. However ingenious inventors may be, however brilliantly scientists may endeavor to substitute the processes of nature, we can never re-create what we utterly destroy. This is the first and important reason for preservation. The next is mundane and more easily grasped by a material world. It is simply a matter of finance.

Millions of people leave their homes each year to travel to distant lands and see places and things of interest and excitement. Wild animals, of which Africa has the greatest share, have lured adventurers and photographers across the world for many years. Each visitor, in his turn, spends cash in hotels, in shops, with travel agents, and in a variety of ways, bringing to a country a form of revenue which is capable of great expansion. To the extent that National Parks provide facilities for the traveller, and offer interest and excitement, they form a major factor in building up a tourist industry.

The next reason to preserve is very simple. It is because we humans derive such immense pleasure from photographing and studying wild nature. Even those people who have no fundamental or developed interest in nature enjoy the excitement of seeing dangerous game or the pleasure of watching graceful, harmless creatures. An increasing proportion of the travelling world has a very profound interest in ornithology. It is nonsense to suggest that this same enjoyment can be derived from seeing animals in zoos or on film and television screens. Nothing can effectively emulate the fairyland of wild nature with its colours, scents and sounds. It would be a tragedy—in fact, it would be a disaster — if Africa were entirely stripped of its interesting fauna.

Finally, and perhaps on the purely sentimental aspect, we humans, as the

accepted rulers of the animal kingdom, have absolutely no right to destroy, or allow to be destroyed, all lesser creatures for one reason or another. Conversely, we have been endowed with a trust, a trust in which the lesser creatures must rely on us to safeguard their very existence. Such endowment gives us absolutely no right to plunder nature's bounty, even if the blind and materialist elements in the world can see no immediate gain in its protection.

Let us accept that the case for preservation is sound, strong and logical. The choice then lies in the best method of preserving. Man, and especially modern man, is outrageously destructive. Methods of preservation must be designed, not so much to safeguard wild creatures from natural hazards and enemies, but from man himself. The positive form of destruction in the shape of hunting, poaching and deliberate killing of animals is easy enough to assess, and it has nothing to commend it when used in the extreme, but it is the more insidious forms of human activity which require immediate attention. Expansion of agriculture, increased human and livestock populations, and exploitation in various ways, all impinge on the habitat of wild animals. Each of Nature's agencies in the process of evolution, and of life itself, is delicately poised to operate within very finely adjusted limits. Each element in Nature's plan is complementary to the other. Man and his domestic beasts, on the other hand, operate like uninspired machines to mow the grass, to destroy the forests, or to plunder the soil. What then is the best method of preservation? How far is human enterprise divorced from Nature's influence?

In my view, the only successful method of preservation is to set aside tracts of land, large enough to allow Nature to operate with the least possible interference by man, and certainly by excluding any permanent human inhabitants. The establishment of Strict Natural Reserves and National Parks is undoubtedly the best way of achieving this. Preservation is a long term scheme, and only scientific research and fuller knowledge will reveal the best methods of wildlife management. This management must be insulated from changing political forces. It must not be directed by expediency. This argues for the creation of a trust administered by an authority charged with certain statutory duties. These duties, if they are to be successful, must transcend all the grasping and unwise demands of immediate human requirements.

In East Africa this has been interpreted by the appointment of a Board of Trustees for each of the three territories, with varying degrees of autonomy but with the same fundamental objectives.

In Tanganyika the Serengeti National Park, established in 1948, has been subjected to certain boundary alterations and excisions, but even in its changed shape it is likely to remain one of the most wonderful game sanctuaries in the world. Vast rolling plains at times carry many thousands of

ungulates followed by their attendant predators. A journey across the Serengeti measures up to the historical descriptions of Africa in the last century. It stands as a game fortress which has not been assailed by the plough, the cow, the goat or the rifle.

Plans have also reached a final stage to create a fascinating crater on the foothills of Mount Meru into a National Park, where, from the rim, an observer cannot escape the impression that he is looking into a section of another planet. This crater, fringed with primaeval forest, is the natural sanctuary for many an elephant, rhino and buffalo, and, due to its proximity to the flourishing town of Arusha, will be a great asset, in addition to the famous Serengeti, in the Territory of Tanganyika.

In Uganda, the Queen Elizabeth National Park includes wide stretches of open water which is the natural home of thousands of hippos and birds, and an interesting chain of volcanic craters where the crust of the earth must have boiled like a porridge bowl. Another National Park takes its name from the famous Murchison Falls, where the main source of the Nile cascades through a narrow gorge with such force that it inspires awe and wonderment. A peaceful journey on a launch up the river to the falls is an amazing experience. The number of crocodiles and other animals along the banks are like a pageant of wildlife.

These two National Parks are in the western section of Uganda, where throughout the year no visitor could fail to be enchanted with the beautiful scenery running up to the snows of the Ruenzori Mountains, and the exciting array of wild animals.

Kenya is proud of a National Park almost in the shadows of the tall buildings of Nairobi. Within a few minutes by car from the centre of the capital, it is often possible to see and photograph many species of animals, even including lions and rhinos. This little Nairobi National Park seems almost unreal. It is astonishing that such a variety of wild animals can be seen, living in their natural state, within hearing distance of the rumble of traffic in East Africa's capital. Between Nairobi and the eastern coast is situated the Tsavo Royal National Park, a large area of unspoiled Africa, so named after the famous story of the "Man-eaters of Tsavo", where lions defied the construction of the railway from Nairobi to Lake Victoria at the end of the last century. It is a suitable and natural habitat for elephants, buffaloes and rhinos, but owing to the lack of open plains does not carry a large population of common ungulates. It is Kenya's main fortress for preservation of wildlife, but it was recently threatened by a terrible onslaught by native poachers. These poachers, using poisoned arrows, snares and pits, killed thousands of animals for the sake of smuggling their trophies, mainly ivory and rhino horn, through a highly organized black market. A successful campaign mounted by the Royal National Parks checked these poaching

activities, and the Tsavo Royal National Park continues to be Kenya's greatest sanctuary for big game.

In Kenya there are also other National Parks on Mount Kenya itself and in the Aberdare Range. Glaciers, alpine vegetation, moorland and forest, present a scene which, although straddling the Equator, has all the appearance of some place far away from Africa. The Trustees of the Royal National Parks of Kenya are also responsible for certain historical and prehistoric sites and for administering a number of reserves, the most famous of which is Amboseli, which are shared with indigenous tribes.

Thus East Africa has made good endeavours to set aside land for the protection of wildlife and to design a successful method of administering such areas as National Parks. They constitute a very vital component in the economy of East Africa, and especially of Kenya, which is otherwise dependent on agriculture.

Whatever one may interpret as the reason for preservation, whether it be for wise land use, for saving the soil, for drawing money from tourists, or merely for pleasure, two salient facts cannot be disputed. The first is that any land set aside for the total protection of wild nature is likely to remain in its pristine state without damage to the ecology or degradation of the soil. Future generations may decide to use the land for other purposes, but at least they will not be deprived of the choice. The other main fact is that the establishment of National Parks, if wisely selected and properly administered, will achieve the protection of a heritage which it is our duty to safeguard for the benefit of a future world.

# Reserves and National Parks in French West Africa

by THEODORE MONOD

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FREQUENTLY IN DENSELY populated countries which have attained a high degree of industrial and agricultural development and which have been extensively altered by human activity, Nature's protectors have had to deplore the scarcity and paucity of areas for which one can still endeavor to secure a certain degree of protection. In tropical regions, however, the problem is quite different; there, for extensive areas, Nature is in fact, if not "virgin," at least untouched, relatively speaking, and the sparseness of the population in turn facilitates the protector's task.

Therefore, one can expect to find in tropical Africa an especially suitable terrain and exceptionally favorable areas of application for the preservation of Nature.

Unfortunately, no good comes of it because, like the Europeans, the Africans too fail to appreciate the problems from both a practical and ethical point of view. Instead of regarding Nature as an asset to be protected, a sacred trust to be respected, something for which one must account in the future, they still regard it simply as a source of profit—of quick profit, if possible—and as nothing more in fact than a prize to be unscrupulously plundered. Thoughtless deforestation, excessive damage to the soil which is undoubtedly irreparable (at least by human power), haphazard interference in Nature's equilibrium with unforeseen (but not necessarily unforeseeable) consequences, needless destruction of animals, too frequently for no reason other than the "pleasures" of the chase, a most respectable occupation of the thinking being—the list of misdeeds in tropical Africa committed by the species "Homo", said nevertheless to be "sapiens", would be too long to enumerate.

The theoretical remedies for this deplorable situation, which is so extremely threatening to the future of nature in Africa, are known. They are the remedies resorted to by all the countries that are intelligently zealous to preserve the beauties of their natural heredity.

The creation of reserved territories is evidently the guiding rule of these remedies. Since one must give to human preservation of the landscape

its legitimate place, since vast surfaces must of necessity be occupied and modified for the development of agriculture and industry, the building of habitations and means of transportation, and since the cohabitation of man and the savage beast is an accepted impossibility, it is most evident that it is necessary to preserve the respective territories for both parties involved. There man can carry out the changes that he feels constrained to inflict upon the primitive biotope—those where, on the other hand, the animal, like the plant, finds itself subjected to the threats of the trap, the rifle, the axe, or domestication.

The creation of reserved areas for the purpose of saving the last shreds of African nature and holding in check the horrible destruction of animals that is already threatening several species of African mammals with total extinction, demands not only decisive action and statutory regulations. It requires much more—support on the part of public opinion at long last concerned with an intelligent and effective protection of the African fauna and flora. The most precise regulations in the world—those which concern French Africa are marvelously detailed—will remain absolutely ineffective as long as they are not spontaneously supported by both the public and—one hardly dares say so—by those responsible for their enforcement.

The success of any policy that will provide effective protection is, first of all, a psychological matter, a matter of mental attitude. One must admit that in the African region here concerned, neither the African nor the colonizer lives in a mental climate favorable to the protection of nature. Inasmuch as other countries frequently show evidence of having attained a higher degree of civilization in this respect, only an active, patient campaign of education and publicity will permit us to someday attain a comparable level. Love of nature, respect for life; the horror which any destruction or useless suffering inflicted upon animals must inspire in a man worthy of the name, are slow and laborious ways of overcoming atavism, instinct and tradition.

Later on, we shall name the existing Parks and Reserves of West Africa. Perhaps it is pointless to insist on what they could and should be.

The West African territories are extensive and there is hardly any touring there; besides, few regions are in themselves picturesque enough to attract visitors. There are few or no mountains, alas—nothing comparable to Yosemite, Yellowstone or the Grand Canyon. . . .

On the contrary, after the vegetation and fauna are gone, one region follows another, from the desert to the great forest, defining very distinctive types of natural regions: the desert, the Sahel, the Soudan, the Guinea savanna, the forest. A logical, balanced plan should strive to attain a distribution of the Parks and Reserves corresponding as closely as possible to the natural regions. The sanctuaries should be located so that none of the large types of areas are without protected territories, not only the climatic "ensembles" (desert, Sahel, etc.) but the various special areas that are super-

imposed on them (for example, mountains, fluvio-paludal areas, Mangroves, etc.). In this way alone will it be possible to save at least a modest "sampling" of the living West-African whole, before it is too late.

As for the role that the Parks and Reserves in tropical Africa should play, it will be determined by the very definition of the various types of protected territories. Let us remember that there are in fact three principal categories: 1st—National Parks, 2nd—faunal Reserves, 3rd—complete or total natural Reserves. The first two of these three types of protected areas can be juxtaposed and combined.

At the present time (1958) the protected areas in French West Africa are as follows:

- (1) The Niokolo Koba National Park (Senegal): 260,000 hectares, completed by 195,000 hectares of adjacent classified forests (hunting forbidden) destined some day to be incorporated into the Park, which will then total 455,000 hectares.
- (2) The Banco National Park (Ivory Coast): 3000 hectares of dense vestigial forest in the neighborhood of Abidjan.
- (3) A National Park called "the W of the Niger," astride the Niger, the Dahomey and Haute-Volta: 1,182,000 hectares, to which are added 1,000,000 hectares of total or partial fauna reserves.
- (4) The whole fauna Reserve of Bouna (Ivory Coast): 900,000 hectares.
- (5) National Park of the Baoule Loop (Soudan): 771,000 hectares with adjacent reserves that complete it.
- (6) Noflaye Reserve (Senegal) destined to preserve an area of sub-Guinea vegetation in the vicinity of Dakar: 16 hectares.
- (7) Total Natural Reserve of the Nimba Mountains (Guinea and the Ivory Coast): 18,000 hectares.

A territory of exceptional scientific interest is the Nimba, the highest point in French West Africa (1752 m.). The area was established in 1944 at the request of Professor Roger Heim, as a total natural Reserve—the only one in French West Africa. It was placed under the scientific jurisdiction of the French Institute of Black Africa, acting as representative of the National Museum of Natural History. On the elevated places of the chain are mountainous species of which certain ones are indigenous. Among the most remarkable of these species are an ericaceous plant, *Blaeria nimbana*, and a small viviparous toad, *Nectophrynoides occidentalis*.

Unfortunately, this admirable Reserve is at present threatened by avaricious mining exploitations because it has iron deposits. If industrial interests warrant, there is danger of the final destruction of this incomparable scientific asset for the profit of economic interests which, after a few years, would

abandon a disembowelled mountain, a devastated forest, a unique biological milieu destroyed forever, and a deserted project with exhausted minerals. Let us hope that French Africa will be spared such folly.

But, in order that French Africa in its turn may become aware of the urgency and, what is no less important, of the beauty of the work to be undertaken, a vigorous informative and educational campaign is indispensable. Plain ignorance is the cause of man's errors and misdeeds; it must be combatted untiringly, in every way possible. Local services or organizations — French Institute of Black Africa, Federal Committee for the Protection of Nature, Soil Conservation, etc., are doing their utmost, often without attaining very much, to awaken people and shake their indifference. The International Union for the Conservation of Nature and Natural Resources, of course, is lending all the moral support possible to local endeavors.

The task to be accomplished is immense and is sometimes discouraging because of its very breadth. There is no doubt that for the success of the task that is to be undertaken for the protection of nature, it is very important to arouse international interest on the part of the public. In this respect the initiative taken by the American Committee for International Wild Life Protection will be salutary and will effectively serve a cause that has already exceeded local or regional boundaries. To combat world-wide peril, there must be a world-wide defense. Henceforth a *planetary* defense of Nature is essential, a defense founded on unique principles, maintained by the common accord of all civilized peoples.

# National Parks in Australia

by A. B. COSTIN

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AUSTRALIA AND ITS TERRITORIES, extending from the tropics of Papua and New Guinea to the ice- and snow-fields of Antarctica, possess scenery and plant and animal life which are rich in variety, scientific value and aesthetic appeal. From the vast deserts of the interior to the snow-capped peaks of the Alps the underlying impression is of wide horizons and spaciousness on a scale found in few other countries of the world. Most of the main forms of world vegetation are represented. There are various types of grasslands, scrubs, salt-bush (shrub-steppe), mallee (dwarf eucalypt), woodlands, savannahs, eucalypt forests, rain-forests and a variety of high mountain and coastal communities. At the same time, much of this vegetation is characteristically Australian, with a large proportion of aromatic eucalypts (more than 500 species) and golden-flowered acacias (more than 600 species), and other largely endemic groups including many unique and beautiful wild flowers such as the boronias (*Boronia*), waratah (*Telopea*), flannel flowers (*Actinotus*), pitcher plants (*Cephalotus*), and kangaroo paws (*Anigozanthus*), some of which are world famous. Of the 10,000 species of vascular plants on the mainland and in Tasmania approximately 85 per cent are endemic. The unusual fauna, with its high proportion of primitive marsupials, further enhances the uniqueness of the Australian setting.

Australia also has the advantage of a small white population (approximately 10 million concentrated in the coastal cities) and little more than 150 years of white settlement, so that, unlike many of the longer settled countries, the broad outlines of the natural scene are for the most part still preserved.

On the other hand, the environment is unusually susceptible to disturbance by the influences of white settlement, to which it shows few pre-adaptations. On the Australian mainland, the aboriginal population was sparse and nomadic, largely dependent on the native game, and subject to fluctuations in number depending on the availability of food and water. This primitive people possessed no grazing animals, and did not cultivate the land. Neither were the native herbivores, most of them defenseless soft-footed marsupials with sparse rather than close-grazing habits, a strongly positive influence in the development of the flora and vegetation. Despite the brief period of white settlement, therefore, this unusual country has already undergone rapid changes, and with the unprecedented increase in population and development

in recent years, the situation with respect to nature conservation has reached a critical stage.

In Australia, the national park movement is still relatively small and young and there are many who do not appreciate its full value. The aesthetic appeal is undoubtedly the one most widely recognized and is increasing rapidly. This is closely related to the inspirational value of contact with unspoilt nature, an important factor in the mental health of the community today. National parks also provide natural landscapes, rocks, soils and plant and animal communities in their original setting for study by the scientist, leading to increasing understanding of the world we live in. Subsequent interpretation to the interested visitor also gives them a high educational value. Finally, national parks provide valuable reference areas against which the effects of various kinds of land use elsewhere can be assessed and the potentialities of depleted areas evaluated. The reservation of land in its natural condition, even in the sparse continent of Australia, can therefore claim its place beside the more generally recognized uses of land for agriculture, grazing, forestry, engineering, industry and suburban development. Indeed it is an essential complement to them.

In this review of national parks, and in the following chapter on fauna, the stand is taken that nature reserves are areas devoted primarily to the preservation of free living nature in one or more of its forms. This excludes the numerous types of town and municipal parks, picnic areas and similar pleasure resorts. A State-by-State treatment is adopted, since the State system forms the basis of nature conservation at the present time. Relevant information is summarized in the table; these permit ready comparisons to be made between the various States, and with other countries for which statistics are available.

To Queensland and Tasmania, two of the least populated States, go the credit for having pioneered the development of national parks in Australia on a reasonably sound basis. In Queensland, under the State Forests and National Parks Act, national parks are the responsibility of the Forestry Department. There is no delegation of responsibility to subsidiary boards and trusts. Park management is of a high standard, with emphasis on preserving natural conditions. The Lamington National Park, a splendid area of sub-tropical mountain scenery and vegetation near the Queensland-New South Wales border, and the sub-tropical islands along the unique Great Barrier Reef, are the most widely visited and best known.

Tasmania's parks are protected as Scenic Reserves under the Scenery Preservation Act. A Scenery Preservation Board controlled by the Minister for Lands and Works is responsible for individual beauty spots, historic sites and examples of colonial architecture besides national parks as such. In its scope, the Tasmanian Board thus resembles the National Park Service in the United States, but it functions along different lines by delegating authority to sub-

sidiary committees. Tasmania's parks provide a strong representation of mountain and lake scenery for which this State is famous, the Cradle Mountain-Lake St. Clair Park in particular being a mecca for bushwalkers from all parts of Australia.

Despite the strong appreciation of national parks in Tasmania, economic pressures for commercial exploitation are being continually applied, as in the other States. Recently, a special enabling bill was carried through the Tasmanian Parliament permitting what was considered to be Australia's finest stand of mountain ash (*Eucalyptus regnans*) to be felled for paper pulp. This magnificent species, which not infrequently exceeds 300 ft. in height and has an established record of 375 ft., is the tallest hardwood in the world.

The State of Victoria has recently followed the example set by Queensland and Tasmania in establishing a National Parks Authority responsible to the Premier under a new National Parks Act. The Authority at present works through committees of management as in Tasmania. The national parks dedicated so far include a fairly wide range of Victorian environments and more are under consideration. The Wilson's Promontory National Park, embracing a rugged peninsula at the extreme south of the State, is probably the most widely known.

In the oldest and most populated State of New South Wales, on the other hand, there is no provision in the legislation for the dedication of national parks as such, except in the case of the Mt. Kosciusko area to which a special act applies. In the case of parks other than Kosciusko, areas can be revoked by notice in the *Government Gazette* or by the Governor-in-Council, and this has happened in some instances, as in parts of the Royal National Park near Sydney. Management is by the trustee system.

The Kosciusko State Park exemplifies the kind of problems which face many parks in Australia today, when, in the face of increasing pressures from other kinds of land use, the controlling body is too often unaware that its primary responsibility is preservation of the natural scene. With an area of more than a million and a quarter acres, Kosciusko is the largest park in Australia, and among the largest in the world. It includes extensive areas of outstanding alpine and sub-alpine scenery, and all of the highest peaks on the mainland. Management is in the hands of a Trust set up under the Minister for Lands, consisting of 10 part-time members representing various interests including grazing, but there are no trained biologists. For many years the only regular source of income for park management was from the sale of grazing leases (which provided the small sum of about £10,000 per annum), as the result of which there has been widespread soil erosion and the virtual elimination of several rare and beautiful alpine plants, including the giant anemone buttercup (*Ranunculus anemoneus*). Following widespread public agitation, however, grazing has now been eliminated from the higher

levels, and both soils and vegetation are recovering. Meanwhile, other problems of park management have arisen from the fact that Kosciusko is also the nation's most valuable water resource, and is now being developed for the diversion and storage of water for hydro-electric and irrigation purposes on an increasing scale. In a country limited by water, most of these operations are accepted as essential, but at the higher levels, where the alpine scenery is quite unique, many have questioned the justification for the purely hydro-electric works (as distinct from irrigation) which have been proposed. Deterioration of park values has also arisen from recreational developments themselves, particularly where the construction of private huts and chalets has been permitted in areas of magnificent scenery. A submission to the Trust in 1958 to have the finest scenery of the park, centred upon Mt. Kosciusko, set aside as a wilderness area, has so far been unsuccessful.

South Australia possesses few areas generally considered to be national parks. Two of these, Belair and Flinders Chase, are the subjects of special acts of Parliament. Most of the smaller reserves are controlled under the National Pleasure Resorts Act by the Government Tourist Bureau.

In Western Australia, most of the national parks are in the south-east corner, where the small population of this huge State is mainly concentrated. These areas are administered under the Parks and Reserves Act by a variety of groups including the Minister for Lands, the National Parks Board, the Conservator of Forests, and others. The small King's Park near Perth is well known for its beautiful displays of wild flowers.

Of the territories administered by the Federal Government — the Australian Capital Territory, Northern Territory, Papua and New Guinea, and the Antarctic Regions — only the Northern Territory possesses nature reserves. Here several areas are now being set aside under a recent National Parks and Gardens Ordinance, the best known being Ayer's Rock near Alice Springs.

It is relevant to add that, whilst properly managed national parks are the best possible kinds of flora and fauna sanctuaries, in as much as they preserve the habitats on which various species of plants and animals depend, flora and fauna sanctuaries also exist as separate entities, under the control of various boards. The situation with respect to fauna preserves is described in the following article by Robert Carrick. In the case of plants, "flora reserves" or individual species may be protected. In the State of New South Wales, for example, various reserves controlled by the Forestry Commission have been declared, although controlled timber operations on suitable areas may be permitted. Several individual species of wild flowers are also protected, without reference to habitat, under the Wild Flower and Native Plants Protection Act. Similar conditions exist in most of the other States.

An important aspect of the present situation is the role of private naturalist organizations, particularly the National Parks Associations of the vari-

ous States and the Wild Life Preservation Society of Australia. Most of the difficult progress which has been achieved is due to the enthusiasm and energy of these groups, often in the face of departmental attitudes which at times have scarcely been sympathetic. On the other hand, scientific groups have so far contributed very little, although with the recent appointment by the Australian Academy of Science of a Committee to report and make recommendations on national parks and nature reserves, progress in this regard can be confidently expected.

From the information presented it will be seen that the national parks established so far include a fair representation of Australian scenery and environments. However, many types of country, particularly the inland and northern areas, the longer settled agricultural and pastoral districts, and Papua and New Guinea, have not yet been reserved. Other notable exceptions are the magnificent beaches and headlands of the New South Wales coast, now being rapidly alienated for residential and tourist developments.

Another problem which is becoming more acute with the rapid increase in population in recent years is the lack of adequate national parklands near the capital cities. This has resulted in considerable deterioration of existing parks through over-use and inappropriate development as pleasure resorts, as in Royal National Park and Lane Cove National Park near Sydney, Belair Park near Adelaide and King's Park and Rottnest Island near Perth. Furthermore, the proportion of parkland in Australia as a whole, and the expenditure on it are small compared with other progressive countries such as New Zealand, Canada and the United States (see Table).

The variety of legislation affecting national parks in Australia and the consequent diversity of administration are also noteworthy. Properly constituted national parks authorities or their equivalents so far exist only in Queensland, Tasmania and Victoria, and of these only Queensland exercises direct departmental control. In these States, national parks are secure to the extent that an act of parliament is necessary before any part of them can be withdrawn. Elsewhere, management is in the hands of a variety of boards and trusts and effective legislative protection is often lacking; policies vary from park to park, and scientific management is rarely applied.

The role of the Commonwealth Government in nature conservation has so far been a very minor one, and many believe that the establishment of a Commonwealth Authority is now overdue. Such an authority would not only be responsible for the dedication and proper management of adequate reserves in Federal lands, but it could assist the States in providing much-needed finance and in developing more uniform standards of park management for Australia as a whole. Such action, if accompanied by national parks legislation in those States which do not yet possess it, could still give Australia a truly national system of national parks equalled by few other countries in the world.

DETAILS OF NATIONAL PARKS\* IN AUSTRALIA, PAPUA AND NEW GUINEA

<i>STATE or TERRITORY Acts</i>	<i>Authorities (Department)</i>	<i>Number of Major National Parks*</i>	<i>Approx. Area of National Parks Total Area (square miles)</i>	<i>Park Area as % of Area of State</i>	<i>Population (1957)</i>	<i>Park Area per Capita (acres)</i>	<i>Annual Ex- penditure per Capita (pence)</i>
QUEENSLAND			1,231				
State Forests and National Parks Act, 1906-57	National Parks Branch (Forestry Dept.)	14*	670,500	0.18	1,404,016	0.6	8.0
TASMANIA			842				
Scenery Preservation Act, 1915-54	Trustee Boards under Scenery Preservation Board (Lands Dept.)	8	26,215	3.20	327,896	1.7	11.0
VICTORIA			489				
National Parks Act, 1956	National Parks Authority (Premier's Department)	13	87,884	0.56	2,673,639	0.1	3.2
NEW SOUTH WALES			2,494				
Various Acts, and Kosciusko State Park Act, 1944-52	Trustee Boards (Lands Department)	14	309,433	0.81	3,624,308	0.4	3.8
SOUTH AUSTRALIA			250				
Nat'l Park Act, 1891; Nat'l Pleasure Resorts Act, 1914-55. Flora and Fauna Board Act	Trustee Boards (Tourist Bureau; Flora and Fauna Board)	5	380,070	0.07	873,863	0.2	
WESTERN AUSTRALIA			69				
Parks and Reserves Act, 1895	Trustee Boards (National Parks Board, Land Dept. and others)	6	975,920	0.007	698,553	0.7	
NORTHERN TERR.			488				
National Parks and Gardens Ordinance, 1955	Reserve Board (Administrator)	2	523,620	0.09	29,301	11.0	
AUSTRALIAN CAPITAL TERRITORY		0	0		37,866		
PAPUA AND NEW GUINEA		0	939				
			0		C. 1,780,000†		
AUSTRALIA AND TERRITORIES (Excluding Antarctic)		62	183,540	0.18	C.11,500,000	0.33	
			5,863				
			3,158,120				

\* Lack of uniform standards with respect to "national parks" in the various States and Territories make comparisons difficult. At this stage the statistics given depend to some extent on the interpretation of the individual reviewer. For instance, Queensland has approximately 250 parks, but many of these are quite small. Since 1958, when the above figures were compiled, several new parks have also been gazetted: for example, along the River Murray in Victoria, in the Blue Mountains of New South Wales, and in Western Australia. † Including native population of approximately 1½ million.

# Wildlife Conservation in Australia

by ROBERT CARRICK

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THE FAUNA OF AUSTRALIA, especially its mammals and birds, is known and appreciated throughout the world by biologist and public alike. The scientific interest of the egg-laying platypus and echidna, and marsupials with their primitive type of mammalian reproduction and their wide range of forms and adaptations, the unusual incubation of the malleefowl and other mound-builders, the dancing display and vocal mimicry of the lyre-bird, the decorated bowers of the bower-birds, the aesthetic appeal of the koala, the large and flightless emu and cassowary, and the laughing kookaburra are but a few items from an unusually rich and attractive store of wildlife. Excluding marine mammals and those introduced by human agency, there are 229 native species of Australian mammals (including 2 monotremes, 119 marsupials, 67 rodents, and 41 bats) and more than 600 species of native birds (about 570 of which nest in Australia). To these elements found in the Australian continent can be added the New Guinea birds of paradise and the penguins, albatrosses and seals of the Australian Antarctic. From both world-wide and national viewpoints it is evident that the wildlife of this region merits conservation in its natural state if posterity is not to be deprived of a heritage that tends to be too readily taken for granted today.

In several important respects the present wildlife situation in Australia differs materially from that in most other countries, and the opportunities, problems and appropriate measures vary accordingly. The principal differences relate to the comparatively recent and relatively sparse colonization of Australia by the white man, and to his subdivision of the continent into separate States—each with sovereign powers over its own land, flora and fauna—and Territories administered by Commonwealth departments.

The Australian aboriginals lived a tribal and nomadic existence, possessed no grazing animals, and did not till the soil. Relatively few in numbers in a vast continent, they used primitive hunting methods which resulted in economic harvesting rather than exploitation of the wide range of vertebrates and invertebrates on which they fed. Apart from their use of fire to catch animals, and their introduction of the dingo, which may have ousted its largest carnivorous rival the thylacine or marsupial-wolf from the mainland, the original Australians seem unlikely to have had any material effect on their environment or on the fauna that evolved in balanced harmony with it. As

white settlement developed during the nineteenth century the natural grasslands became sheep pastures, and scrub and woodland were cleared for settlement and cultivation; and although the human population remained small, the adverse effects on the native fauna of man's legitimate activities were much augmented by the introduction of alien competitors and predators such as rabbit, rat, cat, fox and pig. Recently, J. H. Calaby (1960, *Oryx*, 5: 381-386) has reviewed "Australia's Threatened Mammals," and has listed seven marsupials that have become extinct since the advent of white settlement, and thirty-five marsupial species and eleven endemic rodent genera that can be placed on the danger list. It is heartening to note that the three monotremes are safe at present, and that the koala is on the increase, especially in Victoria, where there is an active management programme. In a survey of the marsupials of New South Wales, B. J. Marlow (1958, *C.S.I.R.O. Wildlife Research*, 3: 71-114) concludes that 22 of the original 52 species are now absent or rare, that this depletion has taken place mainly in the plains while woodland species have survived much more successfully, and that the main causes are interference with natural habitat, introduction of alien mammals, and direct killing, in that order of importance.

The tempo of change has accelerated, especially during the past decade, as the result of large-scale immigration, increasing industrialization, and large schemes of water control for irrigation and power. Over much of Australia the shortage and the seasonal and annual uncertainty of rainfall, and consequently of food, are the key factors which determine the distribution, movements, breeding and survival of many animals, wild and domestic. Although Australia's present population of ten million people averages only three persons per square mile, the arid interior, tropical north and forested mountain ranges in the east are very sparsely inhabited and the main concentration is in the south-east; e.g., Victoria has thirty persons per square mile. Thus the fauna over extensive regions of Australia, and of some habitats such as desert and forest, is as yet relatively unaffected by the advent of the white man. The more immediate problem areas are those extensively alienated and those in the vicinity of population centres, which should have adequate and accessible nature reserves. The essential needs of settlement, agriculture, forestry, mining, hydroelectric schemes and industry must be met; the question is whether these claims must invariably override recreational values and scientific interests, for conservation of wildlife in its natural state means reservation of land primarily for that purpose. This problem is inevitably bound up with that of human population density. At present, Australia differs from most other countries in having to pursue a vigorous policy of population expansion, but the eventual level to be attained should make allowance for more than food production and material needs; it should include the allocation of adequate parks and reserves with their scenic, floral and faunal attributes to provide man with aesthetic pleasure and recreation

no less essential to the full enjoyment of life. That such areas should range in character from those with full public access, where the wildlife would be on show and as tolerant as possible of human presence, to some where the rarer animals would enjoy more privacy, is a view that would find wide acceptance. Whether it should be the aim of wildlife conservation to secure the survival of every existing species is a more controversial point, particularly when this would involve the reservation or resumption of land with actual or potential economic value. In my view, the use of financially valuable land for fauna conservation is justified in the case of zoologically unique or highly popular animals, or in order to provide city dwellers with readily accessible wildlife amenities at low travelling cost; apart from that, lower-value areas should preserve as wide representation of the nation's fauna as possible.

Public interest in Australian wildlife is widespread, and much good work is done by the Royal Australasian Ornithologists' Union, the Wildlife Preservation Society of Australia, the Gould League of Bird Lovers, education authorities, and many State and local naturalist groups and individuals. The full potential of public opinion has yet to be realized, however, and brought to bear more effectively upon the politicians and departmental officials whose task it is to frame and pass the required legislation. The accurate knowledge and grasp of principles on which this should depend has been one of the main weaknesses, but increasing interest and research by biologists, especially since the Wildlife Survey Section of the Commonwealth Scientific and Industrial Research Organization was founded in 1949, is helping to repair this deficiency. Australia still does not possess the high standard of illustrated field guides or informative handbooks on birds or mammals that exist elsewhere, and a large proportion of the basic data has still to be collected. Museums and fauna authorities require to be more strongly supported if they are to acquire modern scientific study collections and good faunal and ecological information on their regions. Documentation of the movements of Australian birds by means of banding was commenced as recently as 1953, when the Wildlife Survey Section launched the Australian Bird-banding Scheme. Where detailed knowledge of distribution and ecological requirements is lacking, many conservation measures and management programmes have to proceed on first principles, one of the most important being to secure areas of habitat likely to sustain populations of each species which are large enough to be self-perpetuating and vigorous.

For a review of existing legislation and types of fauna reserves throughout Australian States and Territories, the reader is referred to the chapter on nature conservation by R. Carrick and A. B. Costin in "Ecological Research in Australia" (edited by F. S. Bodenheimer; *Junk*, The Hague, Holland; 1959). The fauna acts of each State, or ordinances of each Territory, have been drafted independently, and the terms used are not comparable; and

the differences in organization, resources, faunal coverage and protections afforded are such that Australian-wide generalization is impossible, and actual achievement throughout the country varies greatly. Four of the six States have a full-time officer in charge of fauna, and in two of these he is also responsible for fisheries; in two States fauna comes under the agriculture department. With the exception of Victoria, finance and staff—especially qualified zoologists and field officers—are very inadequate. The Northern Territory has a biologist in the Animal Industry Branch at Alice Springs. New South Wales, Western Australia and Tasmania have advisory panels consisting of public servants and biologists, an excellent system that assists administration of the respective Acts and the furtherance of fauna conservation in those States.

The enactments provide for the protection of specified animal groups from direct destruction or interference, and also for reserves and sanctuaries of various kinds. The groups covered are not always the same. All wild land mammals are included, except, in three States, rats and mice (but including the water rat, which has a useful pelt). Northern Territory does not yet have a mammal protection ordinance. Whales and seals may be specifically excluded (Queensland, Tasmania and Western Australia); seals only may be included (South Australia); or these mammals may be treated under fisheries or whaling acts. All wild birds are included, and Western Australia also specifies reptiles and frogs, while the term "animals" used in the ordinances for the Australian Capital Territory and Papua and New Guinea is capable of wide interpretation. In Victoria, the koala has a special protection Act to itself, and in Queensland it is bracketed with platypus and echidna as permanently-protected fauna. The fauna with which these Acts and ordinances deal receives complete protection, with scheduled exceptions, which are considerable and are not always very specifically defined or consistent across neighbouring boundaries. The exceptions are "pest" species and sporting game, principally ducks, for which open seasons are declared. Licenses can be given for scientific collecting, and Queensland, South Australia and Western Australia also issue licenses for commercial trapping of (mainly) parrots, cockatoos and finches, a sore point with other States because of the risk of trespass and weakening of their conservation propaganda. It is difficult to assess the extent to which these regulations are publicly known and respected, especially in regions where they cannot be policed, which in effect means most of Australia. Convictions for violation of them are not numerous. Most authorities recognise that educational stimulation of public goodwill and interest in fauna is the only effective long-term policy, although restrictive legislation is necessary as a reminder that fauna is a charge of the State.

Areas of land, variously termed fauna reserves, sanctuaries or districts, have been declared under the above Acts in each State. The real security of the habitat and its wildlife differs greatly in each case, and the similarity

between two areas in different States may not extend beyond the name. The faunal districts of one mile radius around every school in New South Wales, and the private agricultural properties which by agreement with owners are declared sanctuaries in some States, can hardly be regarded as more than places where the provisions of the Acts against killing of protected fauna may be more strongly enforced than elsewhere. The real problem is to make land completely safe from conflicting forms of use, especially the various economic developments which are the concern of the appropriate government departments, and this is one reason why the fauna authority functions best when independent of such vested interests. The New South Wales "dedicated faunal reserve" has the best legislation of its kind in Australia, in that it is Crown land placed completely under the control of the Fauna Protection Panel for control and management, is specifically safeguarded from mining, felling, grazing, selling or lease, and can be revoked only by Act of Parliament. But only six such reserves exist, although more have been sought, and such important habitats as the homes of the plains kangaroos and the mallee-fowl are not yet included. Other forms of reserve, including water catchment areas and some national parks, are in effect excellent fauna sanctuaries, but a critical appraisal of the systematic coverage and extent of fauna reserves throughout Australia would reveal the need for many more and for a tighter legal hold on some now in existence. The recent example of the Sherbrooke Forest Reserve near Melbourne, where an unusually tame and accessible group of superb lyre-birds has given great pleasure to many people for half a century, should serve as a timely reminder. A proposal to clear part of the old woodland (which covers only 1983 acres) and to plant commercial timber was defeated by the forces of public opinion, and a world-famous bird spectacle that would have taken many years to re-create was saved.

By comparison with many other civilised and more industrialised and developed countries, Australia is fortunate enough to have retained so much of her unique and attractive wildlife, and to possess such extensive tracts of land still in their virgin state or virtually so. Now is the time, when this country is embarking on population, agricultural and industrial expansion unprecedented in her history, to ensure that her assets of nature do not go by default but that they too are conserved and developed for the benefit of future generations. This is a task, and an immediate one, which calls for the co-ordinated effort of scientists, administrators and the public. Not only wildlife biologists, but agriculturists, foresters, engineers, town-and-country planners, tourist officers, and all who are concerned with land use and alteration—and with the material, physical, mental and spiritual welfare of man—should integrate their aims and efforts toward making Australia the envy of older countries, many of whose mistakes can yet be avoided here. The need for co-operation and concerted action between these varied

interests is widely recognised internationally, and a wide range of professions is represented at the biennial conference of the International Union for the Conservation of Nature and Natural Resources (see "Ecology and Nature Conservation," *Nature* [London], 178: 175-177, 1956). The era when time was on the side of nature conservation in Australia is past, and the new and accelerated threats come when the country is not prepared to meet them. The easier aspect of the task, but the one which concerns the lesser threat, is the prevention of unnecessary killing of wildlife; State laws, education and propaganda are steadily building upon the deep-rooted interest of people in animals, so that each succeeding generation can be expected to show an improved attitude toward the direct destruction of wildlife. The more fundamental task, that of preserving permanently and inviolate an adequate and representative series of the places in which animals live, is much more formidable; to it may be added the concomitant task of minimising as far as possible the degree of interference that other forms of land use may cause. Ideally, this calls for detailed and accurate information on the distribution, abundance, movements, habits and requirements of each species, so that a co-ordinated and nation-wide plan and effort may follow. It also necessitates a fundamental re-orientation of outlook by government departments, so that the land essential for wildlife conservation will be allocated to it and legally protected from conflicting uses, and so that adequate finance and staffs will be made available for the management of nature reserves for both their popular and their scientific purposes.

The relative roles of States and Commonwealth in this responsibility is a subject upon which there is no general agreement. It can be argued that much of the wildlife, such as migratory birds, does not respect State boundaries, and that the Australian fauna is a biological entity which should be dealt with as a whole. The Interstate Fauna Conferences which are held biennially provide the opportunity for liaison and co-operation, but all States are not always represented. To date, more effective wildlife conservation has been achieved by the more progressive States in this matter than by Commonwealth Territories, and the realistic outlook for the immediate future would seem to be to explore means whereby the Commonwealth can best improve its own position and assist to co-ordinate the overall efforts of States and Territories into a nation-wide plan. The time seems ripe for the establishment of an office in the Federal Government, under some such heading as National Parks and Nature Conservation, which would be responsible for the development of natural amenities throughout Commonwealth Territories; it could also administer funds to assist States to reserve and manage, by agreed standards, those areas considered to be significant in a national plan of nature conservation.

# National Parks in India

by E. P. GEE

*Member, Executive Committee  
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**A**LTHOUGH THERE WERE probably no real national parks in India in the olden days, yet in the ancient lore of this country we find hints of the national parks idea which was finally developed in 1870 at Yellowstone in the United States of America.

For instance in about 242 B.C. the emperor Asoka's fifth pillar edict gave protection to fish, animals and forests. And before that, in the treatise on Statecraft called the *Arthashastra* (attributed to Kautilya about 300 B.C.), certain forests "with game beasts open to all" were specially protected.

In these forests there was strict supervision and certain mammals, birds and fish were fully protected. If these animals became vicious, they were "to be entrapped or killed outside the sanctuary, so as not to disturb the rest. The extraction of timber, burning of charcoal, collecting of grass, fuel and leaves, the cutting of cane and bamboo, trapping for fur skins and tooth and bone were all totally prohibited". Such forests were called *Abhayaranya*, and in some measures they were the forerunners of the national parks in the modern era. Unfortunately there is now no trace of them left in the ever changing pattern of India, where certain former thickly forested areas are now desert and where regions once wild and remote from human habitation are now opened up by the advance of civilization and increase of population.

During the last few centuries in India, what can best be described as "game preserves" were created and carefully protected by many of the ruling princes in their respective states. Here was a type of park or reserve in which scenic beauty was preserved and game fully protected—except in some instances where the ruler or his closest friends might hunt on the fringes of, if not inside, the preserve. In 1947, when India became an independent and democratic country, the power of these rulers declined almost overnight and their former "game preserves" came under public ownership. Some of these tracts are now the famous wild life reserves of modern India. Among them are the Gir Forest (in former Junagadh State), home of the Indian lion; Bandipur (in Mysore State); Shivpuri (in former Gwalior State); Keoladeo Ghana (in former Bharatpur State), a famous sanctuary for breeding water birds, and Dachigam (in Kashmir) home of the Kashmir stag. Of these five areas Shivpuri (now in Madhya Pradesh) was constituted a national park in 1955, and the other four are now wild life sanctu-

aries with the possibility of becoming state or national parks in the near future.

More or less coincidental with the establishment of "game preserves" by Indian princes in their respective states, a similar process was going on in the British administered provinces of India. As game became scarce around the end of the last century, sportsmen prevailed on provincial governments to create "game reserves" or "game sanctuaries" to serve as refuges and breeding areas for mammals and birds so that they would not disappear altogether. In such manner were created the Banjar Valley Reserve, now Kanha National Park in Madhya Pradesh; Periyar, in Kerala; Mudumalai, in Madras; Jaldapara, in Bengal, and Kaziranga and North Kamrup in Assam. These five latter reserves, now wild life sanctuaries, are likely to be up-graded to state or national parks in the near future.

Thus it has come about that, from the traditions of ancient India when animal life and forests received a certain measure of protection, from the protection given to game and its habitat in the states of Princely India and from the game preservation activities of sportsmen in the provinces of British India, a rich and fertile ground was ready and prepared for the modern national park idea to take root and make speedy growth.

The first national park to be created in India was the Hailey National Park in the (then) United Provinces in 1935. The International Conference for the Protection of African Fauna and Flora had been held in London in 1933, and for the first time concrete definitions of the term "national park" and "strict natural reserve" were framed and accepted. The London conference was followed in 1935 by a national gathering in India—the All-India Conference for the Protection of Wild Life. This meeting was sponsored by the Association for the Preservation of Game in the United Provinces and was largely inspired by Jim Corbett of subsequent literary fame.

This awakening of interest in wild life preservation occurred just as the first national park of India was conceived and constituted, in the very province which was sponsoring the awakening. Unfortunately the great interest aroused in wild life almost completely disappeared within a year or two, and was later totally forgotten in World War II. The name "Hailey National Park" was changed by the Uttar Pradesh Government in 1956 to "Corbett National Park" as a memorial to Jim Corbett, whose home had been in the region and who had so nobly championed the cause of India's wild life in his world-famous books.

The next national park to be created was the Tirap Frontier Tract National Park in 1947. It was located in the remotest part of what is now the North East Frontier Agency. This area is so inaccessible that it might better be termed a "strict natural reserve" or "wilderness area" than a national park.

Bombay State created the Kanheri National Park in 1951, but subsequently changed the name to Krishnagiri National Park. It is small and of not of much national significance. More recently, in 1955, the very fine Kanha National Park and the promising Shivpuri National Park, both in Madhya Pradesh, were constituted. Bihar is taking steps to create the Hazaribagh National Park, eleven miles from the town of that name.

Closely connected with the development of the national park idea in India is the recent revival of interest in wild life preservation which accompanied the formation in 1952 of the Indian Board for Wild Life. At its inaugural session at Mysore the national parks sub-committee drafted a definition of national parks for use in India, a definition later accepted by the plenary session: "An area dedicated by statute for all time, to conserve the scenery and natural and historical objects of national significance, to conserve wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations, with such modifications as local conditions may demand".

It will be observed that this definition closely follows the ideals which were developed in North America and the wording which was accepted by the international conference at London in 1933. The significant words are "with such modifications as local conditions may demand". This latter clause has been further clarified by other resolutions of the Indian Board for Wild Life regarding the creation and management of national parks and sanctuaries in general.

In two respects the state or national parks of India differ from those of North America and Africa. One of these is in size. India being a very densely populated country with villages in the interiors of forests and mountains—even in the remotest valleys of the Himalayas—it is not possible to set aside large tracts of unspoilt countryside for parks. From one hundred to two hundred square miles is the normal size, except in the case of Tirap (800 square miles), Gir Forest (500 square miles) and Periyar (260 square miles).

The other difference is in management. Most of the wild life of India is found in its forests, the exploitation of which is vital to the country's economy. The valuable *sal* timber, for example, in the Corbett National Park has always provided much needed revenue to Uttar Pradesh, and similar forest operations are conducted in Kanha, Mudumalai and Rajaji. All this forest produce is indispensable to the economy of a comparatively poor and undeveloped country.

If the "purists" were to have their way, no forest utilization would be permitted in any of the state or national parks of India. Then, however, some of these fine parks would be abolished, so much in demand are timber, fuel and grazing in this highly populated country. Those interested in the

preservation of India's wild life are forced therefore to make a reluctant compromise: restrict and control these forest operations as much as possible and create "inner sanctuaries" where there will be no logging, so that the minimum disturbance to wild life and to human visitors will occur.

Fortunately there are a number of potential state or national parks in India, with the present status of wild life sanctuaries, where there is no exploitation of forest produce and therefore no disturbance. Among these are Kaziranga and North Kamrup in Assam, Jaldapara in Bengal, Bandipur in Mysore and Periyar in Kerala. It is to be hoped that the governments of the states in which these fine scenic and faunal reserves are situated will do everything in their power to maintain them as inviolate and unspoilt "wilderness" areas, for the enjoyment of present and future generations.

Although the chief functions of state and national parks in India is the preservation of the country's valuable fauna and flora, the recreational and inspirational value of these beautiful areas is gradually becoming more and more appreciated. There can be little doubt that as India becomes more developed and industrialized, greater numbers of her citizens will turn to the parks for relaxation, enjoyment and escape from a crowded and mechanized life.

While the national park idea has fully caught on in India, a constitutional problem with regard to the creation of national parks has recently arisen. It is probable that a technical legal error was committed in the legislation for the Hailey National Park in 1935. This "national" park should have been legislated for by the central government of India and not by the provincial government, for thus it became in reality a provincial park. A "national" institution can only be established by legislation, owned and administered by the national government, as in the United States of America, Canada and other countries, and it follows that a state or province can technically only legislate for its own state or provincial institution or park.

This problem of legislation for national parks is further complicated by the fact that under the new Indian Constitution wild life is a state subject and not on the concurrent or central list. At present, therefore, only the State Governments of the Indian Union can legislate for wild life and for the creation of parks. The Indian Board for Wild Life has endeavoured to solve the problem by drafting a model bill for adoption by states in the legislation for state parks. The word "national" has not been used in this model bill. It is to be hoped that later on some ways and means can be devised, such as the dual financing, control and management of some of these parks by both the nation and the states, so that then the parks can be given the enhanced status and title of "national". In the meantime if those States of the Indian Union which already possess "national parks" were to use the term "state parks" it would make the problem less difficult of solution.

Whether styled "state" or "national", the parks of India are truly national

in concept and have a fascination and character all their own. Many of them contain the distinctive Indian fauna in sufficient numbers as to approach some of the wild life reserves of Africa—with the additional attractions of the scenic beauty of fine forests, clear rushing rivers and lofty mountains. Their value as a national asset is becoming more and more appreciated both by politicians and by the people of India, who are now visiting the areas in ever increasing numbers.

As a tourist attraction for visitors from foreign countries, the value of parks cannot be overestimated. And as they become better developed and provided with more amenities and facilities for visitors, they should, along with the Taj Mahal and Ajanta Caves, provide within the foreseeable future one of the greatest attractions that India has to offer the world.

# Japan's National Parks System and Nature Conservation

by TUYOSI TAMURA

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ONE OF THE CHARACTERISTICS of Japan's National Parks System is that the area of the national parks includes Government properties (mainly the national forests), public properties (prefecturals, cities, towns and village ownership), and private properties. Accordingly, the area may include villages, agricultural and forestry lands, etc. Restrictions on land utilization for the purpose of conserving scenery under the National Parks Act would naturally differ for each locality. For this purpose, the park is divided into special and general areas. Restriction is rather strict for the special areas whereas it is somewhat relaxed for general areas. Since special areas cover the largest part of the national parks, they are subdivided into three categories according to the degree of restriction. Furthermore, those areas are strictly to be kept in their natural condition and are designated Strict Nature Reserves. Thus, adjustment between industries (hydraulic, mining, agriculture and forestry) and nature conservation is made. This type of zoning is most appropriate in a country that is small and densely populated, and as a matter of fact it has been used almost thirty years. England, West Germany and Austria, having established the national parks system in comparatively recent years, have also adopted this system. Probably, to my thinking, Italy and France may follow the same idea. However, United States, Canada, Mexico and the Philippines with their wide and extensive state land may benefit in establishing national parks without privately owned land, and these countries can adopt the "Government land principle" of the United States. Perhaps Burma, Malay, Thailand and Vietnam may adopt the same system as that of the United States, while Formosa and Korea most likely cannot expect to do so.

An advantage in Japan's system is to arouse interest in the owners of the land, as well as the country, in establishing national parks. This may cause over-expansion of the tourist industry thereby being incompatible with usage of land for industrial purpose on the one hand and conservation of scenery on the other. This may easily stir a difficult political problem. In other words, industrial exploitation will get a higher priority than nature conservation and often causes opposition to the purpose of establishing natural parks.

Japan's National Parks and other areas of essentially like nature cover 2,270,000 hectares or about six percent of the total area of the country. Moreover, each prefecture is endowed with more than one, often three, parks and people can go to them and return the same day from the cities where they live. Some of the parks are visited by great numbers of sight-seers, as many as thirty million persons annually going to Fuji, Hakone, Izu and Nikko, etc. These parks are close to metropolitan Tokyo of ten million population and have even shown congestion similar to parks near other large cities of the world. The economic benefits received by the local inhabitants are great and some prefectures are deriving a larger income from the parks than from any other industry. There are many instances of destruction of natural conditions either from people walking around in the area, transportation (electric, buses and cable cars, etc.), or from hotels, restaurants and souvenir shops with all sorts of facilities for the sake of tourists' business. There is need of planning means for distributing people in those parks where there are so many people, by increasing the number of parks. Definitely there is need for more parks to be established in the future. In my opinion, Japan's natural parks should cover at least ten percent of the area of the country.

In view of the aforementioned system together with the great numbers of people taking advantage of these parks, I believe no country has a greater need than Japan for securing more nature reserves and natural parks. On the other hand, there is no country where nature conservation, which is the primary condition of natural parks, has been so ignored as it has been in Japan. Therefore we must exert more effort to establish "Strict Nature Reserves" as a part of Japan's national parks planning; otherwise there is danger of having mere sight-seeing places or recreational areas. Because Japan should be an industrial country and, since people gather around large cities, recreational places must be established for the inhabitants of the cities. At the same time it is important to promote the tourist industry as Japan is a most beautiful country surpassing internationally. For enjoyment of nature, for the cultivation of the finer things of life and for scientific observation and research, the establishment of strict nature reserves is most important.



FIGURE 1. Many national parks and other sanctuaries offer visitors an opportunity to watch remnants of the once-plentiful wildlife of Africa. Here a black rhino stands among acacia trees in Amboseli Reserve, Kenya. In the background is Mount Kilimanjaro, the upper portion of which is in a national park. *Photo by Mervyn Cowie.*



FIGURE 2. "National Parks, if wisely selected and properly administered, will achieve the protection of a heritage which it is our duty to safeguard for the benefit of a future world." Reticulated giraffes occur in Marsabit District Council Reserve, Kenya, which is shared with indigenous tribes. *Photo by Mervyn Cowie.*



FIGURE 3. One of the best-known sanctuaries in Australia is Lamington National Park, Queensland. It is a splendid area of sub-tropical mountain scenery and vegetation. *Photo by Australian News and Information Bureau.*

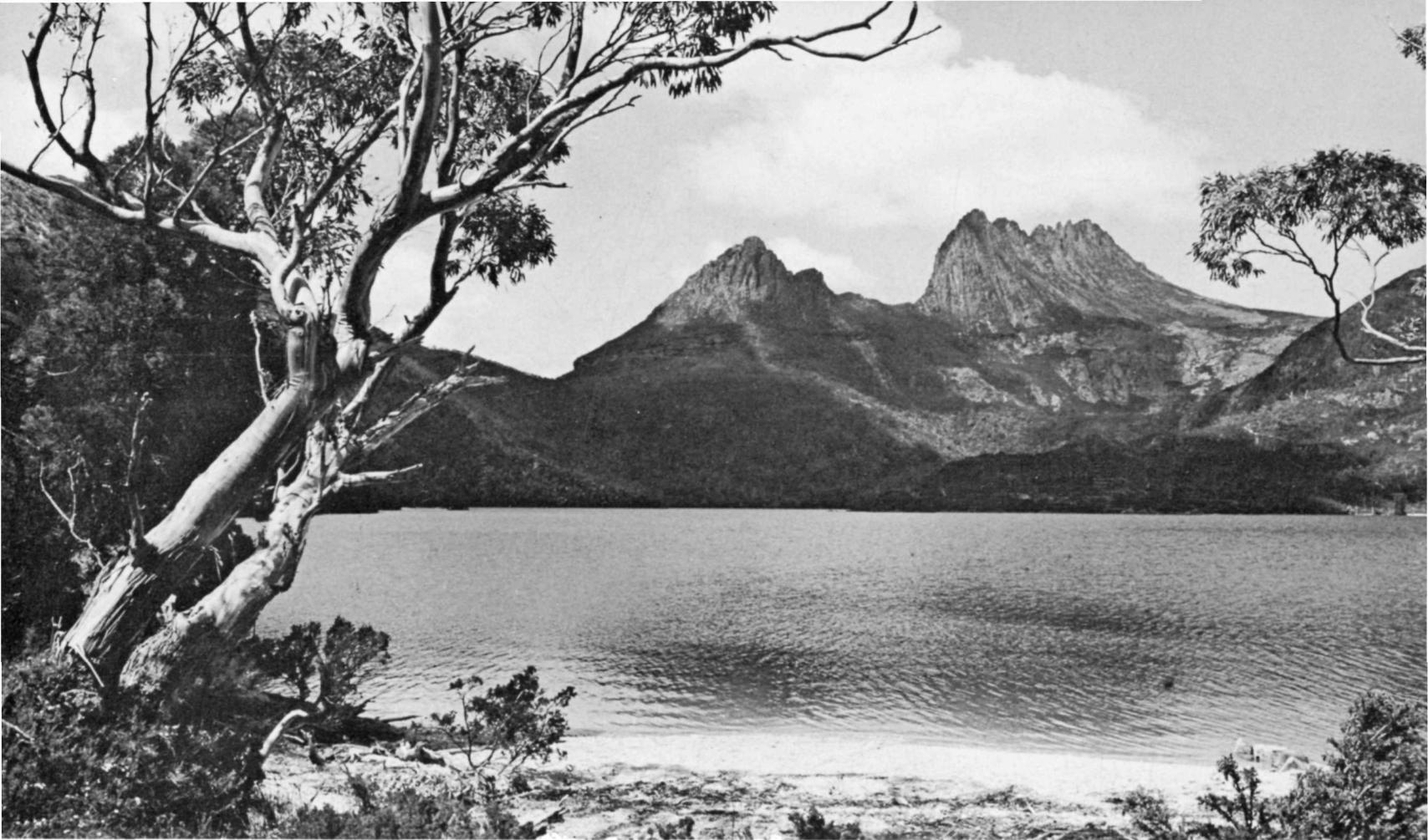


FIGURE 4. Tasmania's parks protect mountain and lake scenery for which the State is famous. Cradle Mountain — Lake St. Clair National Park in particular draws "bushwalkers" from all parts of Australia. *Photo by E. Slayter, Canberra.*



FIGURE 5. The koala "bear," Australia's most popular marsupial, was seriously endangered by disease and by trappers (for its fur) but has been saved by rigid protection. *Photo by Robert Carrick; courtesy Australian News and Information Bureau.*



FIGURE 6. Royal penguins and elephant seals at Nuggets Beach, Macquarie Island (South Pacific Ocean, Australia). Penguins and seals were formerly harvested for oil, but Macquarie Island was declared a sanctuary in 1933. *Photo by Robert Carrick; courtesy Australian News and Information Bureau.*

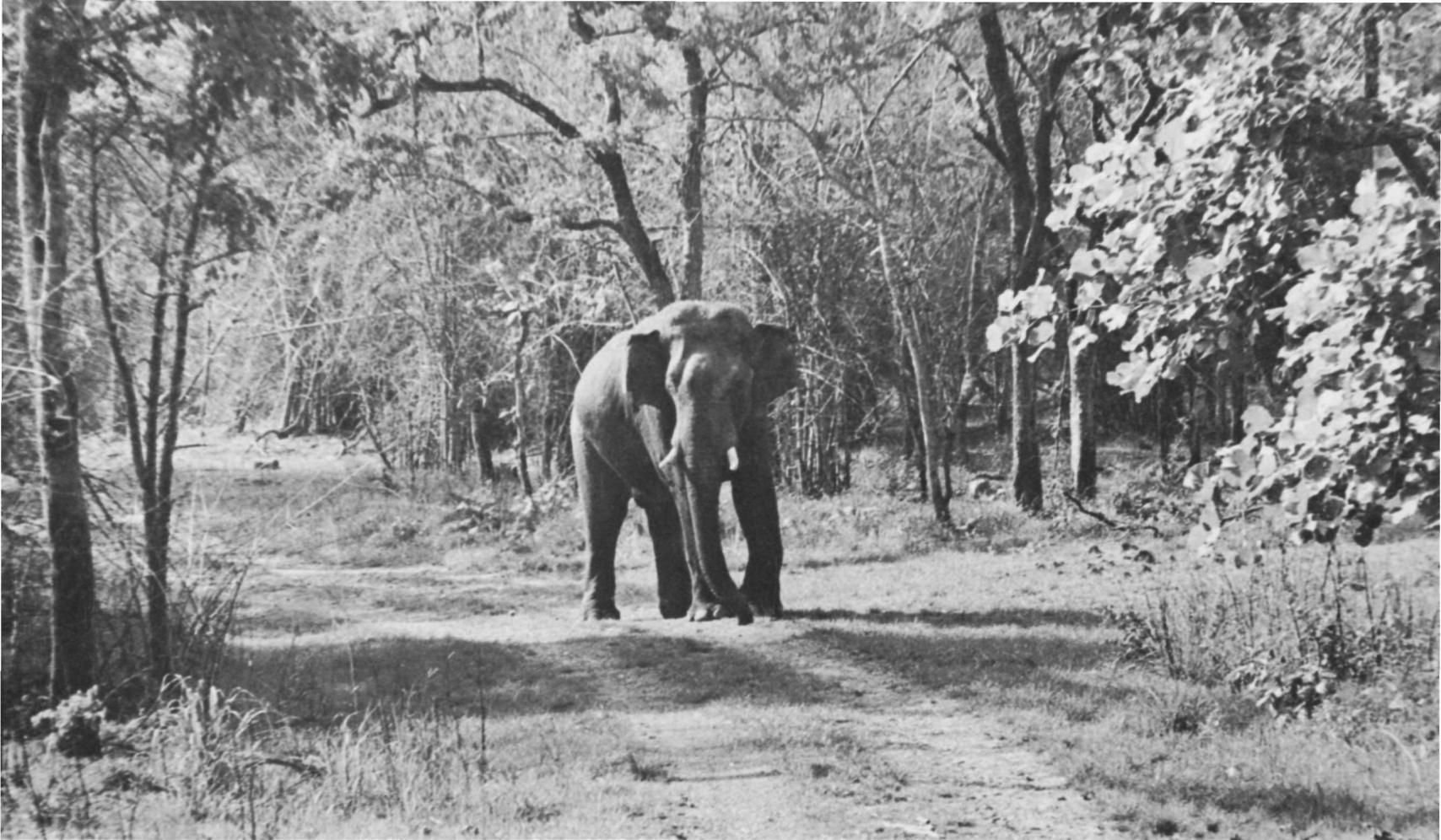


FIGURE 7. Bandipur reserve in Mysore State is one of India's refuges for a few wild elephants. In a country where land is closely utilized, this and other "game preserves" of the former ruling princes are still maintained for public enjoyment.  
*Photo by E. P. Gee.*



FIGURE 8. The Great Indian One-horned Rhinoceros owes its survival in Assam chiefly to the protection afforded by Kaziranga reserve. The government has maintained this area as inviolate and unspoiled wilderness for the enjoyment of present and future generations. *Photo by E. P. Gee.*



FIGURE 9. Akan is one of the national parks which have been designated by the Japanese Government to protect natural scenic beauty and for the free use of the people in promoting health, recreation, education and sight-seeing. *Photo by National Parks Division, Ministry of Health and Welfare.*

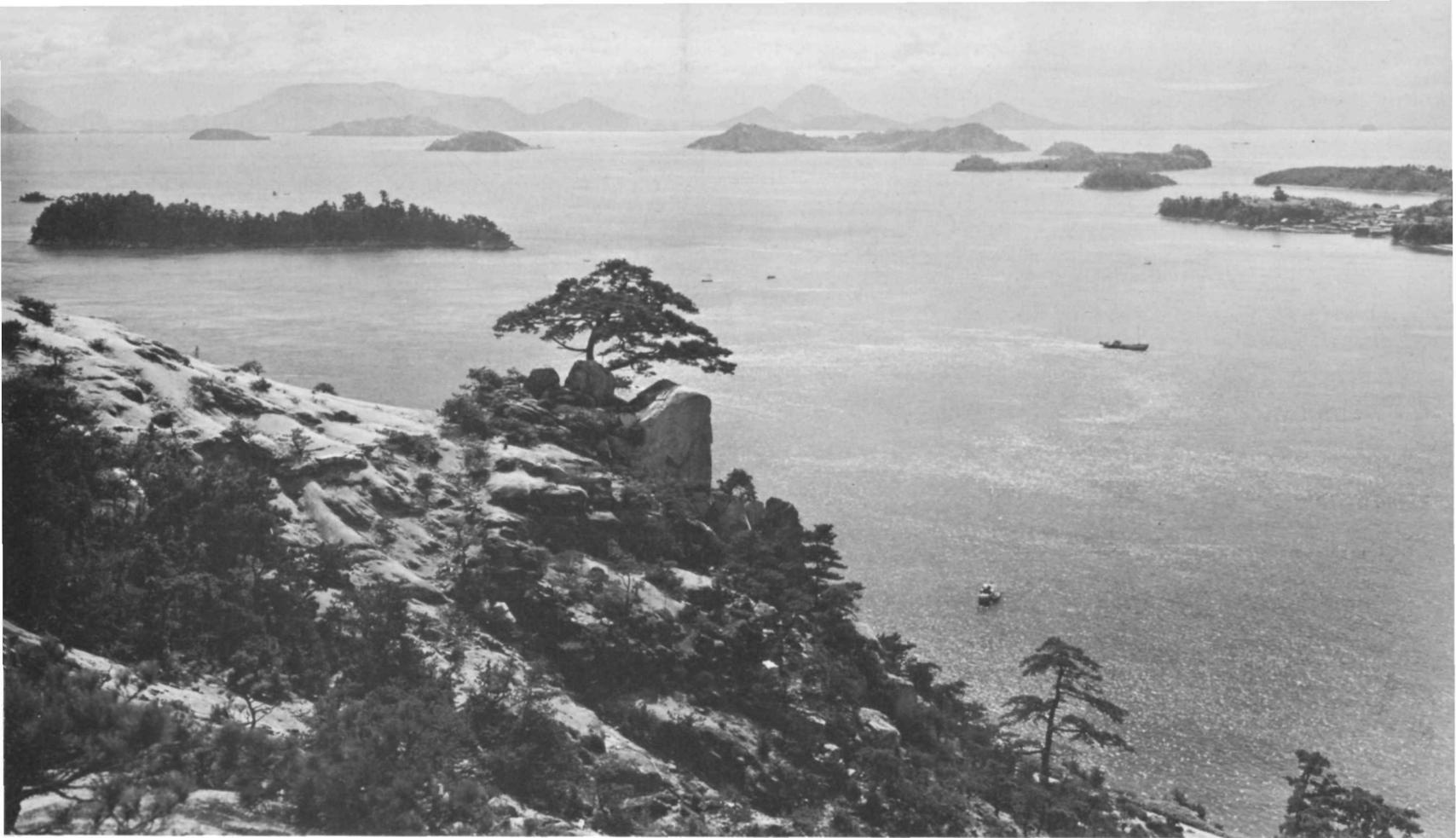


FIGURE 10. Seto-naikai National Park is one of Japan's choice areas for outdoor recreation. About six percent of this densely populated country has been set aside in national parks and similar natural preserves. *Photo by National Parks Division, Ministry of Health and Welfare.*



FIGURE 11. The Swiss National Park is a field laboratory of 160 square kilometers where research is carried out on alpine soils, plants and animals. The results of the studies are applied to agriculture, grazing, forestry and other pursuits. *Photo by Feuerstein.*



FIGURE 12. View up the Spöltal, one of fifteen valleys in the Swiss National Park. Although primarily for research, the park attracts many hikers and tourists who find here something of the primeval wilderness. *Photo by Feuerstein.*



FIGURE 13. The impact of an increasing population on nature is illustrated graphically by this scene and that immediately following. Cortina d'Ampezzo, in the Dolomitic Alps of northern Italy, was a quiet summer resort in 1909.



FIGURE 14. Cortina had expanded by 1956 into a city of strenuous year-round activity, including the Olympic winter sports. Europe needs natural parks for protection of its most beautiful landscapes and for the recreation of its growing multitudes of people. *Photos by Gbedna, Cortina.*



FIGURE 15. The national parks of Canada are choice tracts — part of the original face of Canada — which are used by some six million citizens every year. These areas are a part of the National estate in which every Canadian can claim to be a fractional but undisputed shareholder. Here two “shareholders” admire Peyto Lake in Banff National Park, Alberta. *Photo by Department of Northern Affairs and National Resources.*



FIGURE 16. Canada's national parks function as important refuges for rare wildlife such as the wood bison (total, about two hundred animals) and whooping crane (only thirty-odd survivors). Plains buffalo herds are thriving in Elk Island, Banff, Riding Mountain and Wood Buffalo National Parks. *Photo by Department of Northern Affairs and National Resources.*



FIGURE 17. The "Incomparable Valley" — Yosemite National Park, California. Many Americans believe that "if an area contributes to spiritual welfare, if it provides a sense of oneness with forests, mountains or waters and so enriches their lives, then like tranquillity it is beyond price." *Photo by Ansel Adams.*



FIGURE 18. American parks, while adequate now, will not meet the needs of the future. One of the areas which should be reserved to meet this demand is in the northern Cascade Mountains of Washington State. Construction of mining facilities and logging of the forest in the wilderness approaches to Glacier Park (above, right) would be disastrous. *Photo by David R. Simons.*



FIGURE 19. Seventy-five nature reserves play an important role in the preservation of nature in the Soviet Union. They also serve as laboratories in which biologists, geologists and geographers make scientific studies which have definite connections with problems of the national economy. Sagouramsky reserve (above) in Georgian S.S.R. contains 5,000 hectares and protects remnants of Tertiary flora. *Photo by John Boyd.*



FIGURE 20. The republics of Brazil and Argentina have joined in establishing an international park on their common boundary along the Iguazu River. Here a luxuriant forest is the home of the richest animal life in South America. Most visitors come to see Iguazu Falls, a broken curtain of water two miles long and more than 200 feet high. The cataracts of Brazil's Garganta do Diabo (above) are only a portion of this world-renowned spectacle. *Photo by courtesy of Varig Airlines.*

# National Parks of Japan

by OSAMU IKENOUYE

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JAPAN IS A PART of the Festoon Islands, which form the eastern frontier of the Asiatic Continent. A long, narrow, insular country, Japan lies between latitude 20 degrees and 46 degrees North. Most of its territory is composed of the four large islands of Honshu ("mainland"), Hokkaido, Kyushu and Shikoku, with a total area of 90,674,000 acres. By comparison, Japan is about 40 per cent larger than New Zealand and equivalent to 90 per cent of the American State of California.

The islands of Japan appear to be the highest portion of a huge chain of mountains which rise from a deep ocean bed. These mountains are mostly volcanoes, making the physical features distinctly complicated, both on land and along the seaboard.

Since the country is situated within the belt of the Asiatic monsoon with its typical dampness, the vegetation is notably luxuriant. Moreover, as Japan is located where a warm ocean current meets the cold current, numerous species of flora typical of both the temperate zone and frigid zone are present in abundance. The natural environment of Japan is such that special problems in the species and distribution of animals are inevitable. Unfortunately, unrestricted hunting of animals has gone on for centuries with dire results. Whereas birds are comparatively abundant, mammals native to Japan have become scarce.

Furthermore, due to the climate and the topographical nature of the land there are a vast number of lakes, streams and waterfalls. Innumerable scenic beauties are formed by precipices and caves on the seacoast which was sculptured by wave erosion. Volcanic or hot-spring phenomena are common throughout the country.

Nature in Japan is varied and intricate as a result of the cyclical climatic changes through the four seasons. Unlike landscapes of a continental character, Nature in Japan is full of variety but verdant throughout the seasons. It is no exaggeration to say that "Japan is the country of beautiful landscapes." The principal scenic beauties, which are well worthy of praise as representative landscapes of the country, are now protected and preserved in the system of National Parks.

However, in a country like Japan, with a large population and long

history, comparatively few places can be found where natural scenery has been preserved in its original condition. Such areas with virgin scenery are all the more valuable and the problem of protecting Nature is of utmost importance, not only from sentiment but also for scientific reasons and for public use. Unspoiled scenery is invaluable from a cultural standpoint. At the same time it is undeniable that the idea of nature protection is likely to conflict with the need for economic development for the scarcity of natural resources in Japan.

Among various efforts to preserve nature with some visible effects of man's occupation since the beginning of this country, a natural park system including national parks has played a conspicuous role.

## II. NATURE PARKS

In Japan, certain localities have long been popular among the people as pleasure resorts, such as the so-called "Three Scenic Spots in Japan"—Matsushima, Ama-no-hashidate and Miyajima.

In the Meiji Era, these places for the first time were regarded as "parks" on a democratic basis. The concept was placed on a legislative basis in 1873 when a Cabinet ordinance was issued providing for the establishment of parks on state-owned lands. In compliance with the ordinance, local scenic areas were gradually designated as parks, chiefly as prefectural or provincial reservations, and the public began to take a deep interest in them. After the Meiji Era, under the influence of the federal parks in the United States, voices began to be raised calling for the establishment of a Japanese national parks system.

After a long period of investigation and public education, the National Parks Law was enacted in 1931. As a result, nineteen areas have so far been designated as national parks where natural beauty is preserved and the people are offered an opportunity for pleasure and recreation. These areas now play an important role in the national life and contribute much to international tourism.

As there are many other localities of natural beauty in the country where the government should have a deep concern, the National Parks Law was partly revised in 1949 to enable the government to designate "quasi-national parks," aiming at protecting nature in such places and opening them to all the people as natural parks. Provisions of the National Parks Law apply to twenty such reserves, forming an integrated park system in Japan.

In addition to the natural and quasi-national parks, prefectural governments designate scenic spots as natural parks for the preservation of natural beauty and recreational resources. These local reserves now number as many as two hundred throughout the country.

To summarize: Japan's natural park system consists of three categories

—national parks, quasi-national parks and prefectural natural parks. The three types supplement each other in offering to the people resorts for recreation. To accomplish their significant roles, the park system must be a complete one based on integrated planning and it must be administered properly.

The National Parks Law of 1931 and 1949 was highly useful for establishing a system of areas, but it was found inadequate in providing for quasi-national parks. Also, it was found that local government ordinances were not sufficient to institute proper management of local areas as natural parks. It was, therefore, necessary to take additional legislative steps so as to govern those areas as natural parks.

Consequently, a Natural Parks Law bill was presented to the 26th Diet. As Law No. 161, the bill passed the Diet on June 1, 1957 and went into effect three months later. The new law consists of provisions of the former National Parks Law and additional stipulations necessary to govern quasi-national parks and natural parks which are designated by prefectural governments.

### III. THE NATIONAL PARK SYSTEM

National Parks in Japan have been designated primarily to protect natural scenic beauty. They are to be utilized freely by all Japanese as well as visitors from abroad for promoting health, recreation, education and sight-seeing. Thus the national parks have been established in conformity with the worldwide idea.

Acting on the original National Parks Law, the Government in 1934 designated Unzen, Kirishima, Seto-naikai, Aso, Chubu-Sangaku, Nikko, Daisetsuzan and Akan. This action was followed in 1936 by the establishment of Towada, Fuji-Hakone, Yoshino-Kumano and Daisen as national parks. The expansion of such cultural progress, however, was checked by World War II.

After the war, the national park administration resumed its activities with the revival of the national ideal to build a new cultural country. Ise-Shima was designated as a national park in 1946, Shikotsu-Toya and Joshinyetsu-Kogen in 1949, Chichibu-Tama and Bandai-Asahi in 1950 and Rikuchu-Kaigan and Saikai in 1955. The national park system in Japan is now regarded as almost complete, and the facilities and administration of the parks have gradually been improved. The national parks total nineteen, distributed in thirty-four prefectures ranging from Hokkaido to Kyushu. Their combined areas is 4,360,000 acres, equal to 4.8 per cent of the total acreage of the entire country. Visitors to the parks now exceed sixty million annually, including ninety thousand foreigners.

The quasi-national parks are designated by the Minister of Health and Welfare and are administered by prefectural governors. Among these areas are places of beautiful scenery, comparable to those of national parks, which

must be preserved by public authorities. Some quasi-national parks are suitable for open-air mass recreation, since they are located in the suburbs of big cities. These parks now total twenty with a total area of 2,119,000 acres. Supplementing the national parks in several ways, they form a part of the natural park system of Japan.

The national and quasi-national parks include a full representation of the various types of natural beauty of Japan. They display to the world the characteristic grandeur of which we can well be proud. In the light of the important roles which national parks are to play, their scenery must be better protected and their facilities should be further improved.

#### IV. FEATURES OF JAPAN'S NATIONAL PARK SYSTEM

The Japanese national park system has its own unique features although it is based on the common idea throughout the world. In brief, areas of superlative scenic beauty representative of each country should be designated as national parks to preserve landscape, while facilitating open-air recreation and the education of the people.

The most characteristic point of the Japanese areas is that designation of national parks can be made irrespective of land ownership, just the same as the British system. Basically different from the United States, Canada and many other countries, where such areas must be owned by the country for exclusive use as parks, the Japanese Minister of Health and Welfare can designate state, public and even private lands as national parks. The Minister can further designate special areas inside the park areas to restrict construction works, deforestation, advertisement and other activities, based on a national park program to preserve the landscape of such special areas. This may result in difficult problems concerning commercial utilization of land. In recent years, national park administration has been under stress as a result of development of industrial works, hydroelectric power, and mineral and forest resources.

National parks naturally are extremely significant as choice places for outdoor recreation of the people. Further, the parks provide the best means for preserving the finest examples of natural beauty which the Japanese people are proud of and once they are lost or damaged, cannot be replaced. In fact it is the duty of a nation to utilize every means for protection of the natural beauty of their land against all the pressures that might be exerted upon it. From this standpoint the significance of national parks can never be overemphasized.

# Nature Reserves in the Soviet Union

by L. K. SHAPOSHNIKOV

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**I**N OUR TIME, when industry is developing boisterously and technology is advancing steadily, when the population of the earth is increasing faster than ever and its needs are expanding, it is more necessary than ever before to be concerned with the preservation of nature, which gives man material blessings, the possibility of greater leisure, and esthetic satisfaction that can not be had from other sources.

Zapovedniks (nature reserves\*) play an important role in the preservation of nature. One might call them *natural parks* but our nature reserves differ considerably in the character of their activities from the natural parks, state parks and national parks of other countries.

In the Soviet Union at the present time there are 75 nature reserves. They are under the direction of the government and maintained by the government. Their size varies from a few hundred to hundreds of thousands of acres. For instance, the area of the Mikhailovskaya Tselina nature reserve on the steppes is only about 500 acres, while that of the Altai reserve is over two million acres.

The reserves are significant in many ways. *In them natural scenery is preserved.*

Nature suffers changes under the influence of the activities of mankind. It is therefore important to keep certain natural sections inviolate. This is essential, both for the present generation and for future generations of mankind, to enable them to know the history of their planet and to evaluate reorganizations of nature that come from the development of industry, transportation, agriculture, the increase in population and its various demands. It is evident that for these aims it is necessary to create preserves in all the nature-zones and their geographical subdivisions, giving priority to places where human activity is accompanied by especially great changes in nature.

In the Soviet Union a large part of the reserves are in the European part of the country and in Transcaucasia; that is, where nature has been mastered by man to the greatest extent. Landscapes of Arctic tundra and of northern forests are preserved in the Kandalaksha reserve whose territory embraces a string of islands of the White Sea and the Barents Sea.

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\* Wherever it appears subsequently in this chapter, the author's term, "zapovednik," is translated as "reserve," "nature reserve," or occasionally as "reservation."

The Lapland reserve, in the Lake Imandra region, is remarkable for its hilly tundras and its fir and pine forests growing among a multitude of picturesque lakes.

A diversified taiga, with dense and almost impenetrable forests in some places, while others let more light in, with marshes in places and hilly ridges and rocks in others, is preserved in the following reserves: the Pechora-Ilych, near the sources of the Pechora River; the Kivach in southern Karelia; the Denezhkin Kamen reserve in the central Urals; the Barguzin on the north-east shore of Lake Baikal and numerous others.

In the Prioksko-Terrasny reserve, near the city of Serpukhov, an example of the region around Moscow is preserved in its natural condition. The plant life covering it is very diversified. Here, alongside of fir forests and peat bogs, one comes across tracts of level grassland. A similar combination of the northern and southern elements of nature may be observed in the Ilmen reserve in the southern Urals. The outstanding characteristic of this reservation is indisputably its very rich natural collection of minerals. The visitor to the reserve may become acquainted with these minerals in mines that were worked in the past. These mines are now carefully preserved. The Ilmen reserve was organized by government decree, signed by Lenin in 1920.

The mountain forests of the southern Urals and sections of forest-steppe of the type found beyond the Urals can be seen in the Bashkir reserve. The Voronezh nature reserve has oak forests that are typical of European forest steppes. In the zone of transition from the dense broad-leaf forests to the steppes is the Central Black Earth reserve, in the Kursk district. It contains tracts of forest and steppes of virgin soil.

Various types of steppes are represented in the landscape of the rather small Ukrainian reserves. The most northerly of them, the Mikhailovskaya Tselina, in the Sumy district, shows a grass-covered steppe in its various forms. The Strelets Steppe reserve in the Lugansk district is the habitat of the steppe-marmot. In the Khomutov Steppe reserve, situated not far from the northern shore of the Azov Sea, is a steppe of a type that illustrates the transition to its more southerly variant. The virgin section of the Askania-Nova nature reserve is a typical sample of the southern grassy steppe.

A variety of desert landscapes may be seen in the Barsa-Kelmes reserve on an island in Lake Aral, in the Repetek area in eastern Kara-Kums and in the Badkhyz reserve of Southern Turkmenia. In the Repetek reserve we have a large tract of the Saksaul forest and in the Badkhyz reserve are wild pistachio trees.

Examples of the mountain landscapes of the southern part of the country are preserved in the Crimean reserve of the Yalta and Alushta region, in the Caucasian and Teberda reserves in the western part of the Caucasian mountain range, in a number of sanctuaries of the Transcaucasus, in the "Moun-

tain-Forest" reserve of the Tashkent district and in the Aksu-Jabagly reserve near Chimkent.

In the Far East are four nature reserves—the Sikhote-Alinsky, the Sudzukhinsky, the Suputinsky and the Kedrovaya Pad—in which the diversified and rich nature of that region is represented.

The examples mentioned can not give an adequate idea of the great amount of diversity in the natural scenery that is represented in the reserves of the Soviet Union. In each of them the scenery is unique and preservation in the original state is of great scientific and practical importance.

#### THE RESERVES AS WILDLIFE REFUGES

The chief objective of many of these areas is preservation of the various kinds of wildlife in places where they congregate for breeding or for rest-stops in migration or to spend the winter. With the aim of preserving the waterfowl that winter in the Soviet Union, several refuges have been created. These include the Kzyl-Agach reserve in Azerbaijan and the Hassan-Kuli reserve in Turkmenia, both of them on the Caspian Sea. They also include the Azov-Sivash reserve on the Sea of Azov and the Black Sea reserve near the mouth of the Dnieper River. The Astrakhan reserve on the delta of the Volga River gives shelter to many waterbirds at nesting time and during migrations.

In the Kadalaksha nature reserve colonies of eider ducks, famous for their remarkable down, are protected. Here great swarms of various kinds of aquatic birds nest on the rocky shores of Karlov, Veshniak and other islands. Living close together on small ledges of the cliffs, guillemots, gulls of various kinds, cormorants and the like sit on their eggs or feed their young. The enormous abundance of these birds attracts birds of prey—crows, falcons and large sea-birds. The reserves have a great responsibility for the preservation of rare birds and animals, some of which are threatened with extinction.

The fate of the European bison is well known. Nearly all the animals that were living under natural conditions were killed off at the time of World War I or shortly afterward. The bison appeared to be in danger of disappearing from the face of the earth. In order to avoid that disaster, the authorities began to breed bisons in the nature reserves. Large inclosures were constructed for them and they began to multiply very satisfactorily. At the present time bisons are being propagated in a number of reserves in the Soviet Union—especially in the Belovezh forest in White Russia and in the Priosko-Terrasny reserve. There are now some 80 pure-blooded bisons in the Soviet Union and in addition some 160 others of mixed blood are living in complete freedom in the mountains of the Caucasian reser-

In the Badkhyz reserve in Turkmenia are some of the rare wild asses. At the beginning of the present century the wild ass was to be found almost everywhere in Turkmenia. Now they are largely confined to the foothills of the Paropamiz, between the Tedzhen river on the west and the Kushka and Murgab rivers on the east. Since these asses migrate widely, the number of them to be found in the Badkhyz reserve is not constant. Five hundred or more animals may collect there for the winter and in the summer only a few dozen remain.

At the junction of the Kakhsh and the Piandzh rivers, in Tadzhikistan, the Tigrovaya Balka reserve was created. In it today the very rare tugai deer is preserved.

In the territory of the Lapland reserve, in the Lake Imandra area, there are still some wild reindeer, which were formerly widely diffused over northern Europe. It is important to preserve these animals, not only in the interest of science but also to make it possible to cross them with the domestic reindeer in order to improve the latter through the higher biological qualities of their wild relatives.

#### THE ROLE OF THE RESERVES IN ESTABLISHING ANIMALS IN TERRITORY THAT THEY DO NOT NOW OCCUPY

Favorable conditions in the reserves contribute to the successful propagation of many wild animals. Their number grows and it often happens that the territory they inhabit becomes too densely populated. In such case they overflow into the surrounding territory.

The sable, muskrat, hoofed mammals and gallinaceous birds—that is an incomplete inventory of the valuable creatures whose emigration from the Russian “parks” is a common occurrence.

It often happens that these wanderers move tens and sometimes hundreds of kilometers from the limits of the reserves. Thus hunting territories are enriched at the expense of the sanctuaries. But often man helps in this transplanting of animals. For example, every year river beavers are trapped and moved out of the Voronezh reserve into various parts of the country. As a rule, they adapt themselves to their new homes very nicely. According to the estimates of scientists, more than ten thousand beavers of Voronezh origin are now living in the Soviet Union. The beavers emigrate also in important numbers from the Berezin reserve in White Russia and from certain others. As a result of the efforts to protect and diffuse beavers, their number is increasing steadily in the Soviet Union. But there was a time when beavers were on the verge of extirpation.

In addition to the beavers, deer (red deer, spotted deer, the Siberian and Caucasian stags), sables, muskrats and certain other animals are transplanted.

## THE RESERVES AND SCIENCE

In nearly all the reserves of the Soviet Union scientific studies are carried on regularly. The majority of the reserves are provided with their own scientific specialists, laboratories and museums, but for these research projects scientists come also from the academies of sciences, universities and other scientific institutions and educational institutions of the country. The results of the research studies appear in the publications of the reserves and also in various periodical publications. Scientific data gathered in these areas are used in the preparation of substantial monographs concerning nature in the Soviet Union. For instance, such materials have inspired the writing of voluminous works such as the seven-volume *Wild Animals in the Soviet Union and Neighboring Countries* by S. I. Ognev; the *Principles of Botanical Geography* of V. V. Alekhin; the *Steppes of the Soviet Union* of E. M. Lavrenko, and *Soil Moisture* by A. A. Rode and others.

Our reserves are often spoken of as nature laboratories. In them scholars find exceptional conditions for observing wild animals and plants in their natural environment, not only throughout the entire year but continuously for many years when desired. In connection with the scientific activity of the reserves, it should be noted that these scientific studies have definite connections with some of the problems of the national economy and with important large-scale state measures. Thus the Astrakhan nature reserve is used for the study of natural processes in the lower part of the Volga delta, where changes in the natural environment have been brought about by the construction of hydroelectric stations. The Darwin reserve is the site of studies on the course of natural phenomena in the area of the Rybinsk reservoir, which inundated the bed of the Volga above the town of Rybinsk.

The forest reserves afford opportunity for study of the natural renewal of forests and of methods of restoring forests. At the same time the staff examines the influence of wild hoofed animals on forest culture and on reforestation. Great attention is given to working out methods of protecting forests from harmful pests. In several reserves, methods of raising ginseng and other valuable plants are studied.

As we have already said, the reserves give attention to the distribution of animals. In connection with this problem, at the Voronezh reserve experiments are conducted on methods of raising beavers under natural conditions and also in captivity and with ways of trapping and transporting them. A farm has been established for the artificial breeding of beavers.

With the aim of developing scientific principles for the preservation and sensible utilization of commercially valuable animals, research is being carried out on their biology. Particular attention is being given to the sable. Other studies are devoted to the antelope of the steppes, to the European squirrel, the common fox, the raccoonlike dog (*Nyctereutes procyonoides*) and to the marten, otter and other fur-bearers.

The reserves on the Black Sea, the Sea of Azov and the Caspian Sea are sites for cooperative studies of birds that winter there and measures are devised for their protection under these conditions. This work is directed by the Commission for the Protection of Nature in the Soviet Academy of Sciences.

Several reserves are engaged in working out methods of attracting useful insectivorous birds to the forests.

For the purpose of studying migrations, biologists in the reserves occupy themselves with banding and marking animals. The headquarters for this work is the banding center of the Commission on the Preservation of Nature, where banding and marking data is handled. In the Kandalaksha, the Oka and the Caucasian reserves, ornithological stations have been created for the purpose of studying the migrations of birds.

The reserves also conduct ichthyological investigations. Thus, studies are conducted in the Pechora-Ilych reserve on the dynamics of the reproduction of salmon in the upper reaches of the Pechora River. In the Darwin reserve, the migrations of fishes of commercial value in the Rybinsk reservoir are observed.

The Pechora-Ilych reserve is working on the domestication of elk (European moose). These efforts have given practical as well as theoretical results. At the present time a herd of domesticated elk is living primarily on natural forage and pasture in the taiga under the observation of a herdsman. These animals are not afraid of man and will eat delicacies such as cabbage or various roots out of a man's hand. The cows are milked, although they do not give a great deal, usually from 1.3 liters to 1.6 liters a day (less than two quarts) and a total of not more than about 80 quarts for the entire milking period. Elk milk, however, is high in food value, with up to 19% of butterfat and large amounts of vitamins A, C and D.

The elk are also used as work-animals. They carry packs through swamps and across tracts covered by wind-thrown trees where a horse could not get through. In the winter they are hitched to sleds.

To a certain extent, in all the reserves observations are made on the influence of climate on plant and animal life. Inventories of animals are taken and many other studies are made leading to the registration of natural phenomena. This scientific work is carried on in close cooperation with the institutes and branches of the Academy of Sciences of the Union, with the academies of sciences of the soviet republics, the universities and other institutions.

#### PRACTICAL WORKING EXPERIENCE FOR STUDENTS

Students of biology, geography and geology in the universities and even in teachers colleges and other institutions of higher learning find in the

reserves exceptionally favorable conditions for combining practical work with their studies. In addition to the unique opportunities to observe nature, they get a great deal of help from the staffs of the reserves. Their fellow-workers consult them concerning every sort of question about natural science. The students are given opportunities to work in the laboratory as well as in the field. They are furnished scientific equipment and their transportation is paid.

During this practice period the students begin to learn a great deal about nature, to puzzle out her secrets and to acquire habits of field research. The more gifted ones sometimes succeed also in accomplishing scientific tasks whose importance goes far beyond the limits of the interests of the reserves and of the institution in which they are students.

Tourists do not flock to the Soviet nature reserves in great numbers as they do for instance to the national parks of the United States of America. The tourists are to be found more often outside of the reserves, especially along the shores of the Black Sea, around the lakes of Karelia, in the mountains of the Caucasus and of Middle Asia.

The Soviet reserves are not advertised to attract the public and they have few visitors except those who come for special purposes. In order to keep the areas as quiet as possible for the animals and to furnish the best conditions for observing the phenomena of nature over as long a period of time as may be required, it is essential that the number of humans be kept to a minimum. At the same time those who have a serious desire to come receive permission to do so and over two hundred thousand persons annually visit the various reserves of the Soviet Union. This number is made up basically of students and naturalists who combine a vacation with nature-study.

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Concerned about preserving, restoring, and enlarging the natural riches of the country, and also taking into consideration the needs of science, the Commission for the Preservation of Nature of the Academy of Sciences of the Soviet Union prepared proposals as to where it is essential to create new nature reserves. At present the work of organizing these reserves is under way.

# The Swiss National Park

by JEAN G. BAER

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**M**ORE THAN FIFTY years ago a group of Swiss scientists conceived the ambitious project of establishing in the Alps an immense field laboratory. It would be a station where research on the alpine flora and fauna could be pursued over long periods of time under unchanging conditions since the area was to be protected from the effects of human activity.

This basic idea led to the creation of the Swiss National Park which was officially recognized by the Federal Government in 1914. It is of interest to record that as far back as 1906 the nucleus of the Park already existed. At the 8th International Congress of Zoology held in Graz in 1910, Dr. Paul Sarasin of Basle, Switzerland, presented the aims of the promoters. At the same time, he also proposed a resolution that was carried unanimously, for establishing a Provisory International Commission for the Protection of Nature. The advent of World War II prevented the Commission from becoming effective and it was only in 1948, with the sponsorship of UNESCO, that such an organization was created. Today it bears the name of the International Union for Conservation of Nature and Natural Resources; its Secretariat is in Geneva.

The Park covers an area of about 160 square kilometers in the Lower Engadine, between the Inn and the Italian border. It comprises some fifteen valleys, most of which are deeply encased and separated by mountainous ridges or high passes. The highest peak is Piz Quattervals, slightly more than 3,000 meters above sea level and usually surrounded the year 'round by snow and ice. Small streams that rapidly become torrents after heavy rainfall or in the Spring when the snow melts, run along the bottoms of the lesser valleys. The river Spöl traverses the National Park from the Italian border to the Inn. The lower slopes of the valleys are densely wooded with conifers. The dominating species is the Alpine pine together with its pro-cumbent variety that occurs on the highest slopes where it is associated with the stone pine and the larch. Timberline is somewhat above 2,000 meters and it is not unusual to find there the skeletons of former trees that, owing to the very dry climate, have defied the attacks of insects and fungi.

An interesting feature of the Park is the presence of two distinct types of subsoils of which dolomitic rocks are predominant but with localized outcrops of acid rocks of Permian origin. This of course means that different types of plant associations may occur in neighboring areas. Also, the degree of acidity or alkalinity of the water naturally influences the microscopic flora and fauna.

Although most of the Swiss National Park is inaccessible in Winter owing to heavy snowfall and even though there is much rainfall in the Spring and Summer, this region is one of the driest because dolomitic rock absorbs water very rapidly.

All scientific research is coordinated by a special commission set up by the Swiss Academy of Sciences which is also represented on the administrative council appointed by the Federal Government. Publications are in either French or German and, since 1940, all scientific results of the research undertaken in the National Park are published in a special series of monographs. Up to date, there have been published 39 memoirs, illustrated, comprising 5 volumes of about 300 pages each. Many of these papers report on research that has been pursued continuously over periods of several years.

A complete floral inventory has been prepared and will be published in the near future. Several groups of Arthropods (Lepidoptera, Hymenoptera, Acaria), have also been inventoried and monographs of the higher Fungi and Lichens are already published. Much of the present work is concentrated on ecology of the larger mammals — red deer, roe deer, chamois and ibex.

Since the National Park was created primarily for scientific purposes, tourists are restricted to certain tracks and paths from which they can observe all the larger species of game and the most important and interesting plant associations. An international highway traverses the National Park from north to south and an inn is located near its center where tourists will find all the necessary amenities. From here, many of the trails reserved for hikers can be reached. Moreover, in Val Cluozza, one of the wildest regions of the Park within four hours walk of Zerne, an alpine hut has been built where tourists may obtain meals and spend the night. It is thus possible to be afoot at sunrise and observe chamois, marmots, red deer and roe deer feeding in the early morning on the higher pastures above timberline.

The Swiss National Park is an area that for the last 40 years has been returning slowly to a state of primeval nature. On the alpine pastures, where formerly cattle and sheep were grazed, there are now deer and chamois. These pastures have evolved gradually and have been replaced with different associations of grasses and other plants that have today reached a new climax. All the stages of this change have been observed year by year within several marked-off areas where the full picture of the transformations in-

volved is regularly checked. Photographs taken from established points make it easy to compare the different stages.

In another section a considerable area was destroyed by a forest fire. Within weeks a group of botanists had moved in to study the consequences, to measure the depth to which the subsoil and its bacteria had been destroyed, and to mark out plots in which the natural regrowth could be studied. Such research is possible only if its continuation can be assured and if the results are constantly kept up to date. A new generation of scientists replaces the older members, and methods may change but research continues along similar lines. This is the real significance of scientific research in the Swiss National Park, a field laboratory that cannot be duplicated in any other part of the country.

The tourist and the nature lover find in the National Park something of the primeval wilderness, where both life and death, plants and animals are completely free to associate; where such associations are constantly being formed; or destroyed according to their degree of adaptiveness to the prevailing conditions. However, the beauty of the scenery, the silence of the forests or the high pastures, the roar of the torrents, express more than an idea, they have become a necessity for modern man, for his moral health as well as for his mental balance.

# Why Europe Needs Nature Parks

by WALTER STRZYGOWSKI

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(Abstracted by the author from his book, *Europa braucht Naturparke*, published in 1959 by Berger Verlag, Horn, Niederösterreich, Austria.)

*"I trust that in the future we shall regard knowledge of the beauty of the earth as the most important form of geographical knowledge that we can diffuse . . ."*

— SIR FRANCIS YOUNGHUSBAND, in his presidential address to the Royal Geographical Society, London, May 1920.

**B**EFORE 1945 THERE WERE no national parks in England; today there are ten. In Germany the only park for the preservation of nature was the Lüneburger Heide (Lüneburg Heath); today there are eight parks and in West Germany alone twenty-four more are planned. We hope that the other states of Europe will follow their example and that gradually protection will be given to all the most beautiful landscapes of Europe, by making them officially nature parks.

We prefer to designate such parks as *nature parks*, in preference to *national parks* or *natural preserves*. The American type of national park is no longer feasible in Europe. Neither are there extensive unused areas of fine scenery that could come into the possession of a nation and we could not wish to have the most beautiful scenic areas reserved for a single nation; they ought to be open to all peoples of Europe and overseas for recreational purposes. A term such as *nature preserve* or *nature reserve* indicates protection of plants and animals from man; what we want is to preserve the outstanding scenic areas of Europe for the benefit of man. The term *nature park* also has the advantage of being easily translatable into other languages. In speaking of one of these parks one can simply use the local name with *park*; for example, Pyrenees Park, Tatra Park, etc.

By the term *nature park* we mean a piece of land distinguished by beautiful scenery and that has been very little altered by man. It should be large enough to permit hiking for several hours in one direction and its chief purpose is to provide pleasure and recreation to any visitor. The land may remain private property and with proper care parts of it may be used for agriculture or as private forests. Establishment of a nature park does not include the provision of shelters, eating places, overnight accommodations and the like. When near large cities, we can even imagine nature parks without buildings.

If we compare the areas that are popular with vacationists from the various cities of Europe, we find common characteristics. Mountains, forests and water are especially prized, and also pure air and quiet. In the Alps the mountains are the chief attraction; in hilly sections, woods; at the seashore and on islands, water is the most important. Areas where mountain, forest and water are united in harmony are considered the most attractive, as in the Lake District of England, the Vierwaldstättersee in Switzerland, the Salzkammergut in Austria and the northern Italian lakes. Today, unfortunately, these areas are so overrun by tourists and so changed that it is too late to attempt to protect them.

In Germany the authorities are feeling the necessity of dividing the new nature parks into two parts, an interior park and a border zone. In the interior there would be no automobile traffic but only footpaths and paths for horseback riding, plus perhaps some roads for agricultural and forestry purposes. Also there would be no overnight accommodations, though possibly some refreshment stands. Quiet must be assured. In the border zone automobiles would be permitted as far as the parking places, tenting areas and overnight accommodations.

At first, consideration was given to choosing park areas which would lie as far as possible in a ring around the big cities and at a distance that would permit easy commuting to the park from the city for week-ends. In the future, that concept will probably be abandoned as the building of more and better automobile roads increases the radius of such a ring. For longer vacations people will travel easily to very distant areas by plane or car. For that reason even the most remote areas of scenic beauty in Europe should be protected as soon as possible from being built up, from industrialization, from deforestation, from being broken up into small tracts, from being developed. Waterpower must be used in such a way as not to have harmful effects on the scenery or on the management of the parks.

Most of the nature parks that we would advocate for Europe will be summer parks, wherein only simple shelters for summer use are necessary. More valuable are summer parks that offer possibilities for recreation and sport in winter also. Such parks ought to be on the mainland and preferably a thousand meters above sea-level. In them more substantial buildings with heating facilities for winter are desirable. In the Mediterranean region there will be all-year parks, that provide opportunities for recreation in spring and in autumn also.

Establishment and equipping of nature parks is naturally the task of individual states or of divisions of the same. The more this work can be decentralized, the better. As a general rule the initiative will be taken by a club or other private organization, which later will try to secure the support of the authorities and legal backing. On the other hand, to promulgate the idea

of nature parks, a central European organization would be advantageous. So far there has been nothing of the kind. Such an organization would have to urge the individual states to follow uniform guiding principles in establishing nature parks. Such a central organization could be founded in cooperation with one of the existing international corporations in Geneva, Strassburg, Luxemburg or Paris. In such a corporation, botanists and zoologists of the various states must work together with the representatives of automobile clubs, travel bureaus and other organizations concerned with the coming and going of travelers. Thus far the biologists have been hostile to the other groups; this is dangerous for the future.

Because of the development of automobile travel and the steadily increasing amount of leisure time of ever greater strata of the population of Europe, the stream of recreation seekers flowing into the regions of scenic beauty is swelling rapidly from year to year. In Germany, for instance, it is estimated that the number of people going abroad will double by 1980. If these masses of mankind spread out over the landscape without any control, we can be sure that the last of the peaceful forest-covered hills, the lake shores and the seacoasts will be disfigured by houses, fences, automobile highways, parking places and camp-sites. If, however, beauty and quiet are to be preserved for double or triple the present number of travelers and vacationists, it is urgently necessary that people in all branches of activity work together toward a common goal.

The stream of travelers from America, Asia and Africa will increase in volume. American visitors to Europe in general are primarily interested in the sights of cultural interest, since they have even better preserved scenic beauty in their own country. However, Americans in increasing numbers are reserving the best hotels in the traditional recreation areas and for that reason new accommodations for Europeans are needed everywhere. Such accommodations should no longer be provided in large hotels and in boarding houses closely crowded together. They should be spread out loosely, not in the most beautiful terrains but at their edges. Not on the lake shores and the seashore but at some distance away. The urge of people to acquire ownership of scenic areas, either in order to enjoy them alone or to profit from them financially, is unfortunately strong everywhere. The protests against this trend that have been made by learned men in idealistic clubs have been completely ineffectual. A much stronger organization, with strict regulations, must be set up very quickly in Europe; otherwise this scenery will be irrevocably lost and that would be most unfortunate. With this we come to our real theme, why Europe needs nature parks.

### PHILOSOPHICAL REASONS FOR THE ESTABLISHMENT OF NATURE PARKS

Environment makes the man. To develop his personality a man needs to look at the things of this world himself and to think about them. Farmers, wood-cutters and sailors for the most part have concepts of the world that they have developed themselves from their own observations and so have within themselves a standard of values. They show satisfaction and good humor. City-dwellers, on the other hand, are constantly surrounded by manufactured things and exposed to the struggle for material values. The course of the sun, the passage of the seasons, heat and cold, fog and snow, storms with thunder and lightning, the glistening stars, mean little to them. Neither do natural dangers and man's triumph over them, a triumph which tends to produce self-confidence and which leads one to recognize that in reality the things made by man are less important than the works of nature. In spite of their opportunities and the marvels of modern industry, many people are dissatisfied. They recognize that the standard of living is a false god. A turning away from material values, however, must result in a turning toward the things of nature. For that reason we must protect what remains of unspoiled nature for the future.

We look upon mass-conformity as one of the chief evils of the city life of today. Each individual believes that which is pointed out by newspapers, the radio or television, without using his own judgment. The desirable opposite of this is not isolation; we do not advocate nature parks for the purpose of providing quiet for those who hate their fellow-man. The quiet is merely to provide opportunity for thinking about oneself, about God, about the world. The story of Robinson Crusoe is a wonderful parable. In the quiet of nature a worthless city-dweller becomes a valuable man and a Christian. Finally he goes back into society greatly improved. If nature parks can help even a part of the city-dwellers to become better people, all the expense of establishing them is justified, especially now at the beginning of the atomic age and space travel. Educated Europeans are convinced that we earthlings do not have a right to spread out over other planets until we know how to make our own earth a peaceful garden. And we are still a long way from that.

Our great cities would be condemned to extinction if they were not constantly receiving people from the country. In the cities coffins are more numerous than cradles. People are more anxious to have an automobile than to have a child. That is an indication of an abnormal scale of values. A natural life requires the use of all the powers that nature has given us. To suffer from heat and cold, from hunger and thirst on occasion, to have to use all our powers of body, spirit and soul, is in accordance with the plan of nature. If we are spared all of that by air-conditioning, elevators and a thousand other city gadgets, our own life is debased and we become victims of

deficiency diseases — caused by a deficiency of natural living. The parks are needed for that also.

Every person who does creative work knows the beneficial effects of quiet amidst beautiful scenery. In the city one worries for weeks over ideas and plans without accomplishing much. Then a vacation away from the city works a miracle. Out there inspirations come, one's intuition works, one has bright ideas. All of which leads to a natural conclusion that with the loss of scenic countrysides will come a falling off in Europe's mental, spiritual and intellectual ability.

Alexis Carrel, the great French physician and champion of the reorganization of human life, says: "Every scientific discovery depends upon meditation." The true scientist always leads an intensive inner life. Human life was formerly simple, slow and peaceful, even in the cities. One was able to do creative intellectual work even in cities such as New York, Paris or Berlin. Industrialization brought noise, restlessness, excitement. Peace and quiet are luxuries that scholars can no longer afford. With the increasing mechanization of life, scientific work in Europe is declining. In America, scholars for the most part have a quiet college campus. The Russians are laying out their research centers in lonely wooded areas. We Europeans also are going to have to move our research establishments to the edge of the nature parks.

From the Americans we have learned "human relations" between management and staff, between employers and employees. Many large corporations are looking for opportunities to establish vacation homes for employees and their families. The number of such homes will be increasing very rapidly in the next few years. For them also we need nature parks, not only in the homeland of the workmen and other employees but all over Europe. Already vacation travel to lands of foreign speech is forming an exceedingly important bond among the peoples of Europe. The elderly people of Germany, England, France or Italy still hate each other frequently. They learned that from their elders in two world wars, that is tradition. But the younger generation often spends a good part of a year in a foreign land, or even entire years. They become thoroughly acquainted with their neighbors and may even love their weaknesses. These young people can not be inoculated with hatred for other races even by the most vigorous propaganda and they look with suspicion upon anybody who attempts it. The uniting of Europe began with coal, iron and steel, with the most important material goods; another uniting should now begin in the uncultivated land that has so many idealistic values. Europeans wish to build upon the economic unification and advance to political, cultural and spiritual union; they are slowly coming to realize that the present is not the best order, that they are doing things backwards.

MATERIALISTIC REASONS FOR ESTABLISHING NATURE PARKS  
(MAN MAKES HIS ENVIRONMENT.)

In the past the mistake used to be made of supposing that the ability of a country to supply food increases necessarily with an increase in acreage. We know today that in every district there is a limit beyond which productivity declines. The balance between forest, wasteland and cultivated fields has never been carefully investigated; we know only that the entire Mediterranean region and England and Ireland are suffering from excessive deforestation and urgently need reforestation. In many parts of Spain, Italy and Greece no nature parks can be established at present; there the problem is to spend several generations reforesting the land that has been made barren.

Any cultivation and improvement of valuable plants requires going back to the original stock. If we cultivate every wild area, we thereby rob our descendants of many possibilities that we can not even foresee at present. We can not, however, have experimental islands of wild area in the midst of cultivated land; the permanence of such a wild spot is assured only when it is separated from cultivated land by forests. For that reason we ask that in every future nature park small nature reserves be laid out in the interior, that will serve science as experimental plots and that will be accessible only to scholars. We need nature parks to protect the last remnants of wild areas.

Arguments in favor of nature parks are usually based on the assumption that life in the great centers of population is steadily becoming more unbearable. New factories are constantly being built to pollute the air, water is becoming contaminated, even the sea is covered with a film of oil, the air is filled with the roar of motors. Man therefore needs islands of peace and quiet in order to be able to exist at all, in order to get a new lease on health at least a few times every year.

We can not let this reasoning pass without some further comment. We can not permit the world to be divided into healthful nature parks and the remaining unhealthful land, which may be further spoiled at the pleasure of irresponsible individuals. Furthermore the idea of making our world a more healthful place to live in must be extended to the cities. We need laws there against water contamination and air pollution, against noise and stenches. The industrial cities of Europe that have been growing in the past 150 years without benefitting from past experience, without research studies and with little thought for the welfare of others must in the next 150 years make way for more healthful and less compact cities. The nature parks are a beginning of the improvement of the entire picture.

In all parts of Europe there is a steady flow of population. It flows from the high land into the valleys, from the plain into the cities, from the villages into industrial areas. Even industry itself is slowly moving from the interior to the sea-coasts because the raw materials from overseas can be gotten there

with less expense. Numerous measures have been proposed to combat this flight from the land: forbidding the bringing of new industries into the cities, mechanization of agriculture, changing over from the traditional general agriculture to specialization with irrigation, combining small tracts into large farms, planning carefully for new industries in formerly agricultural areas. We consider this last tendency to be dangerous, if industries are to be allowed to crowd into fine scenic areas. Almost every out-of-the-way area in Europe, if it has a surplus of manpower, tries to attract new industry, with government help whenever possible. There is grave danger in that, since areas of fine scenery may become industrialized when they are better adapted to providing recreational facilities. Sometimes, also, industries are introduced that will later prove unprofitable because of their remoteness. In areas in which developments are contemplated, studies should be made before industries are brought in, to determine whether the region may not be better suited to developing facilities for recreation. Careful studies in Bavaria and in the Tyrol have shown that in many farming communities the income from tourists is higher than that from farming. Instead of subsidizing new industries, the state ought rather to promote the construction of tourist accommodations in what used to be farm communities. This suggestion applies not only to the Alps but to most of the mountain and hill country of Europe.

A long list could be made of the geographic regions of Europe that are in urgent need of nature parks. Scandinavia and Finland are extremely rich in forests and at the same time they are thinly populated. At first glance nature parks seem unnecessary, yet even here there is need for them right now. For example, new paper mills are being planned near Kirkenes in Norway, not far from North Cape. There is danger that the area around Lake Inari in northern Finland will be deforested, which would mean the loss of one of the finest recreation areas. In Germany, France and Belgium the hill country needs to be protected so that it may continue to be accessible to all. Everywhere hill farms are being bought up by city dwellers for use as summer homes, the cultivated fields are growing up to brush, the woods are overcut and new military installations of all kinds are usually set up in the forests. On the peaks are radio, television and other towers. New automobile roads and mountain trails lead into what was formerly quiet natural scenery and they bring crowds of people from the thickly populated parts of Europe. There is, therefore, urgent need of establishing nature parks in these areas. In Ireland and Scotland, in the Netherlands and in Denmark, there has been excessive deforestation, which has exposed the land to the winds from the sea. Here our chief task will be to extend protective screens of trees in the flatlands, after the French model of groves and rows of trees, and to reforest the hill country so far as possible.

In the mountains the growth of noisy amusement places with their ex-

cessive activity by day and by night constitutes a danger that needs to be checked slowly. The more secluded mountains are less endangered for the reason that people travel on foot less than they did in the nineteenth century. The decline of farming in the mountain regions makes reforestation of the less productive cultivated fields, meadowland and pasture land imperative.

In Italy during the past fifteen years on many coasts broad strips of beautiful pine forest have given way to streets, hotels and villas and the pine forests are in urgent need of protection. The situation will soon be similar on the coasts of Spain, Portugal, Yugoslavia and Greece. All the hill country of these lands needs reforestation for several generations. The present-day gas stoves and oil stoves make it possible to put an end to the traditional cutting of underbrush and the making of charcoal.

# The National Parks of Canada: An Investment and a Trust

by IRENE BAIRD

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**I**N 1960—FOR THE thirteenth year in succession—Canada's sixteen National Parks and twenty-two National Historic Parks and Sites broke all past attendance records.

More than five and one half million Canadians, and visitors to Canada, flocked through them—an increase of half a million visits over 1959.

This rising curve of National Parks use is not a trend limited to a few, or even the larger, parks. It affects them all. It is felt as much on historic Cabot Trail in Cape Breton Highlands National Park, Nova Scotia, as along the spectacular Icefields Highway that links Banff to Jasper—the senior park in the system to the largest in area. But running up attendance increases is not something that a park has to be big to shine at. In 1959 the largest increase was recorded by the smallest park—6-square-mile Point Pelee on Lake Erie in southern Ontario.

Why people in any country are richer for their National Parks few of the multitudes that throng them may ever stop to reflect. They go there for a holiday—not an exercise in the philosophy of management.

For most Canadians it is enough that the parks are there. Splendid to the eye, renewing to the spirit and body, spacious habitat for wildlife, a part of the National estate in which every Canadian can claim to be a fractional but undisputed shareholder. Lands like these are not casual or accidental groupings of scenery for which no other useful purpose can be found. These are choice tracts—part of the original face of Canada; their lakes, rivers, streams, and seacoasts among her oldest waters.

Today we have 18 million acres of reserved lands—and important gaps still to be filled. The total area of the scenic parks is 29,288 square miles.

The National Parks extend from Newfoundland on the Atlantic coast to British Columbia on the Pacific and northwards into the Northwest Territories. The six mountain parks set among the Rockies—Banff, Jasper, Yoho, Waterton Lakes, Mount Revelstoke, Glacier—account for some 30% of the total attendance. This is spectacular country. Snow-hooded peaks with their immense glaciers; great timber stands, foaming rivers—a true mountain domain. The home of grizzly and black bear, moose, elk, mountain sheep, mountain goat, deer, beaver, wolf, and a host of smaller game.

In character the parks reflect the contrasting life of their regions. At points of maximum contrast they range from St. Lawrence Islands—a tiny group of wooded islands in the St. Lawrence River—to Wood Buffalo, 17,300 square miles of half-tamed wilderness with a foot on either side of the Alberta-Northwest Territories boundary. Wood Buffalo, still undeveloped for tourists, is the home of two rare and solitary wildlife species, the wood bison and the whooping crane. Bulletins on the fate of the migrating whoopers speed back and forth between the Canadian Arctic and Texas and find their way into the columns of the London TIMES. Beside the whoopers the wood bison are quiet stay-at-homes. But they are now so rare that, since the Canadian Government confirmed the find a year or two ago, the small herd of about 200 animals are believed to be the only survivors of the original race in North America. The wood bison and the whooping cranes are two species that take a National Park's functions as a wildlife refuge to mean what it says.

The bison and the cranes require only to be left to lead their lonely lives in peace. Meeting the needs of the human population of the National Parks is far less simple. This upsurge in attendance—as every parks officer knows, no matter what country he belongs to—is raising the most urgent questions throughout the field of management. The central problem in fact that besets both policy and administration is how to combine a high standard of service to an increasingly mobile public without impairing the fundamental purpose of the parks. Aggressive urban development, sharply competing types of land use, multiplying means of low-cost transportation and changing recreation patterns make this problem more acute, more complex, year by year. Every facility has its limits of use. Land, like people, must have periods of rest; the chance to recuperate. And when the limit is reached use must be re-planned or in some way re-adjusted to meet the new conditions.

In a country the size of Canada it seems far-fetched to contemplate a day when anyone could be turned away from a National Park because there is no more room. Why not simply go on increasing the number of parking lots, the areas of the campgrounds, the miles of highway—on and on to take care of the crowds?

But these are not simply big public recreation areas—these are National Parks. Lands where the limiting factor is not how many people can be packed into a given number of square miles but *how many the land can support without impairment*—without burning away the irreplaceable heritage that is to be handed on to Canadians in perpetuity. Not merely handed on for as long as the land can survive but enriched by wise and imaginative management.

It is not change itself but the gathering speed of change that has called for so great a re-appraisal of National Parks planning. In 1885 when the first reservation was made—10 square miles in what is now the 2564-

square mile area of Banff park—the events that were to affect their development so greatly were not even in the realm of ideas.

A revolution has taken place in our recreation resources, mobility, buying power, leisure time. Even our power of enjoyment burns up faster. On vacation we expect to be amused for as many of the twenty-four hours as we can keep awake. It would be strange indeed if the impact of all this had not been felt by our National Parks.

Their management, both at headquarters and in the field, becomes more challenging year by year. The Superintendent of a major park must be a highly-trained and many-sided man. He must combine a proven talent for getting things done with a flair for working smoothly with the public in great numbers and many moods. His routine duties include planning and inspecting all work carried out throughout the park; townsite planning, maintenance of municipal services and supervision of recreation areas; sanitation and public health. He must know the type of highways his park ought to have, how to get them built and what it takes to keep them maintained in all weathers. His professional, technical, and office staff must be the best men and women available.

Senior headquarters officers at Ottawa—such as the Director of the National Parks Branch of the Department of Northern Affairs and National Resources, the Chief of the National Parks Service, are long-service career men who have been Superintendents at one or more of the largest parks. A new top level position created in 1959 was that of Regional Supervisor of Western National Parks; it was filled by promotion of the Superintendent at Banff.

The Parks' Warden Service is made up of men who deserve to be remembered more often than they are. The terrain of the mountain parks requires that warden teams, highly-skilled at Search and Rescue operations and fire-fighting be kept always at the ready. This is the kind of work that builds a tradition. Many a Park Warden has risked his own safety far beyond the call to rescue stranded climbing parties or some lone climber or skier adrift among the peaks in avalanche country. Warden Training Schools in Mountain Search and Rescue, Winter Ski and Rescue, and Fire Controls are held yearly at Banff under the direction of the Warden Service.

A major administrative step taken within the past few years was the setting up of a Planning Section in the National Parks Branch at Ottawa. For in every approach to management the aim is to work out of short-term, emergency solutions, the legacy of piecemeal development. This cannot be either rapid or easy. You cannot change the face of a landscape like, say, the fashion industry can decide to introduce a revolutionary new line and scrap everything that went before. You cannot make sweeping command decisions like that in the development of National Parks. Like many home-

owners, parks planners have to start with what was there before they moved in and see how they can make the best use of it.

One of the first things the Planning Section got to work on was an inventory of all types of development already in each park. Against this were weighed immediate and predictable needs and a long-range plan prepared. High on the list of early development was a greatly stepped-up campsite program. Camping is the fastest-growing use of the National Parks and it comes close to being the ideal use—or the use that most nearly approaches what the Parks were created for. Camping in its modern sense—pitching a tent within range of water, chopped wood, a kitchen shelter with a stove and some good fishing, hiking, and riding, is about as close to nature as most families wish to come when they start off for an out-door vacation.

This is life in the smaller camping areas—a mere turning off the highway into a wooded glade at a lakeside with room for perhaps less than a dozen tents. In the big campgrounds and trailer parks things become more complicated. In one day last summer the popular Tunnel Mountain campground at Banff received more than 500 registrations. Now 500 registrations is equivalent to about 2000 people. And when 2000 people in a single day set up housekeeping in an already crowded area the Superintendent and his staff have problems. Problems of traffic control and parking space, water supply, garbage collection, power—just about all the problems of a small town moving in and settling down for a stay. This was just one campground, in one park, on one day.

Keeping up with the highway system in the National Parks has posed—and always will—formidable engineering problems. Many of the roads were built years ago when present levels of attendance were undreamed of. Now in progress is a large-scale program of trunk highway reconstruction that by 1965 will have built, or re-built, some 450 miles of trunk highways to a standard adequate to handle traffic (it is hoped) for many years to come. Highways, sidewalks, bridle paths, hiking trails—when we visit a National Park we expect to find them all.

Some of Canada's most memorable roads are in the parks. The Icefields Highway, the Cabot Trail, the miles that sweep the shoreline of Lake Waskesiu in Prince Albert National Park, Saskatchewan, the winding climb through the forests to the Alpine meadows of Mount Revelstoke in British Columbia. The section of the Trans Canada Highway in Glacier National Park runs through the same mountain country of rock-falls and snow slides where earlier Canadians had the impertinence to dare to build a railway to the Pacific coast. If the Warden Service deserves to be remembered so, too, do a long line of all-but nameless Parks engineers.

In a setting where the only legal shooting is by camera the effect on generations of wildlife is fascinating to observe. Big game and small go

about their business in the parks leaving man to mind his. Instinct by now informs big game residents that if a mishap occurs on the highway when they are making a leisurely crossing, theirs is not the blame. A dented fender is a clear case of human error.

Visitors who follow the trails — stepping softly, keeping an ear cocked for crashings in the bush, providing an audience for the flutes and piccolos of the birds — have their reward.

But this sylvan impression of nature caring for its own is false. Range and species must be kept in balance; wildlife populations disease-free and under control. If angling is good in such heavily-fished waters it is less likely to be the blessing of a benign Providence as the work of the limnologists at the fish hatcheries. In game and forest management the National Parks Branch is assisted by the Canadian Wildlife Service and the federal Department of Forestry.

About four years ago the Branch made an appointment it had long wished to make — Chief Parks Naturalist — and took the first steps towards creating an Education and Interpretation Service. This type of service is so widely used in so many other parks systems that it is needless to explain its purpose in any but the simplest terms. It is to develop a program that offers visitors the chance to know their National Parks in depth. Not merely as so many miles of highway driven in a day but for the natural wonderlands they have always been.

Almost every type of Canadian wildlife except far northern species, is to be found somewhere in the National Parks. At Jasper a fascinating combination of fauna and flora lies just off the beaten track. Many of the rock formations in Banff are spectacular; regional history embedded in rock face. Riding Mountain National Park in Manitoba, and Point Pelee, in southern Ontario, both lie along the Mississippi Flyway. The Atlantic parks with their maritime characteristics and great flocks of sea birds have an ecology not found inland. At every park there is something to learn. But you must know where — and how — to look for it.

The work of the Education and Interpretation Service adds no new dimensions to the parks. It is simply the act of restoring the original colours — creating a relationship between parks and people that is vital to the survival of the National Parks principle and all that it stands for.

In time this discovery of new values can affect the attitudes of great numbers of visitors. If they can enjoy experiences that they cannot get elsewhere, are they not less likely to demand the kind of attractions that a National Park cannot — and was never meant to — provide? And to demand instead more of the experiences that it is ideally fitted to offer?

Canada's National Parks system is large mainly because we are a spacious country. We do not — as so many countries do — have our heads pressed against the ceiling, our population bursting its borders. Our national popu-

lation, that is. For there seems no reason to doubt that *the population of parks users will continue to multiply faster than the number of people living in Canada*. The population of Canada recently passed the 18 million mark; on the basis of recreation trends and population increases it is quite conceivable that by 1980 between 16 million and 20 million people will be pouring into the parks each year. By then we shall be looking back nostalgically to the opening years of the 1960's as almost wilderness periods.

What will the parks be like by then? Even distinguished prophets can be out-run by events. Sir John A. Macdonald, speaking in the House of Commons at Ottawa in 1887 in support of the Bill to create a National Park — those 10 square miles among the Rockies — observed that he could foresee the day when it would become a great public attraction.

Canada's first Prime Minister, were he in the House of Commons today when National Parks Estimates come up for Parliament's approval, might be pleased to learn how greatly he had understated the case.

# The Meaning of National Parks

by SIGURD F. OLSON

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IN 1961 MORE THAN seventy-two million people visited the national parks of the United States and it is estimated that by 1975 this figure will increase to eighty million. This means that a third of the country's population went to these superlative scenic areas last year. Some stayed for several weeks, others less fortunate merely drove through them catching only glimpses of their beauty. No matter how long people stayed, however, or how brief their experience, they invariably brought away with them not only memories but deep-seated satisfactions that will remain as long as they live.

One of the criticisms of the National Park Service program for these areas is that 90 per cent of them are kept as inviolate wilderness, only 10 per cent being developed for hotels, cabins, tourist facilities, and roadways. Critics say, "Why save all this wild country? Why not open it up so more will be available not only to those who have the strength to walk the trails into the back country but to the vast majority who never see anything but its fringes?"

The answer is a simple one. Without the presence of the primeval, the great appeal and significance of these areas is gone. It is the wilderness that gives them character and the very quality for which people come. Without it the national parks would be only scenery. With it they have spiritual appeal. It is true many get their sense of the primeval only by glimpses but in such glimpses, no matter how fleeting, they capture something that brings them back time and again, returning to satisfy a need that springs from their own primeval past and one that seemingly cannot be satisfied in the modern world of which they are a part.

What is this need and why do people feel they must find an escape from the tensions, pressures, and artificialities of an industrial age? Again the answer is simple. As a race we have not yet progressed far enough in our development to ignore our past. When the great historian Trevelyan said: "We are children of the earth and removed from her our spirits wither," he spoke the truth. We are still so close to our beginnings that we can not ignore them no matter how clever we become or how hard we try. In spite of comforts and the fact that we have more of the amenities of life than ever

before, we still have a nostalgia for the primitive scene and for the impact it provides. Without some opportunity to renew the ancient ties, as millions do each year by visiting such natural areas as the national parks, life would be different indeed. In a sense, wild country and the unchanged scene has become a spiritual necessity to the people of America and, as time goes on, it is destined to become increasingly true.

One has only to look at the history of our race to realize why this is so. A hundred thousand years have elapsed since the emergence of *Homo sapiens*, with vague beginnings running back possibly a million years or more. During practically all of this time man has lived close to the earth, regulating his life by the seasons, knowing the fears as well as the joys of a life close to simple and natural things. Only during the last thirty to forty thousand years has he developed any sort of culture; only during the last five thousand, historical records. During the past one hundred years, however, he has made greater strides than in all the rest of his existence, has tried to wean himself from close contact with the earth and to sever his remaining ties with the past. In the last decade of this amazing century, he has embarked on an adventure in the space age with enough control of the physical world to threaten himself with destruction.

A strange and violent world is his today, with the great silences of the unknown replaced by the roar of jet engines and the cities he has built vibrating with noise. The smells of woods and field and forests are replaced by those of combustion and industry, his senses bombarded with impressions he has never experienced before. He has come a long way during the past one hundred thousand years and were it not for the submerged nine-tenths of his subconscious, a subconscious steeped in a racial experience that knew nothing of technology, he might make his adjustment more easily. Unfortunately the biological processes of any species, even *Homo sapiens*, simply refuse to be buried. Adaptations take aeons of time.

Moderns may think they have bridged the enormous gap between their present way of life and the past, but this is more difficult than it seems. We have only to look at the high incidence of mental illness to know that something is radically wrong. Man being unprepared for the machine age is beset by nostalgias and frustrations. He tries desperately to make an adjustment, filling his days and nights with diversions and excitements, dashing from place to place looking for some panacea that will fill the void within him, but no matter how sophisticated he has become, he is so thoroughly conditioned psychologically and physiologically that the only panacea is in making contact with the out-of-doors. Unless he can return every so often to the world of nature, he is unhappy. He may not know it when he heads for the national parks, he may think he is going for scenery, color pictures, or possibly some fishing, but in reality it is for something far more funda-

mental. He goes for a certain sense of detachment and perspective that is good for his soul.

This need of wilderness experience is inherent in all races from the most primitive to those furthest removed by civilization. The cities may cover it up and make people forget temporarily but underneath is an almost universal urge to re-establish themselves with the powerful forces that have dominated mankind for ages. Julian Huxley, in commenting on the need of this type of experience, said recently:

"One function of the earth whose importance we have only just begun to recognize is that of wilderness, the function of allowing men and women to get away from the complications of industrial civilization and make contact with scenery and unspoiled nature. In more general terms, the function of conserving nature is one to which we must assign a not inconsiderable area of the globe's surface."

To place a value on national parks is as difficult as to place a dollar sign on historic landmarks, heirlooms, or a great poem. There are certain things that cannot be weighed on ordinary scales because their major importance lies in the field of the intangibles. The wilderness quality of national parks is in this category. While a park may have great worth as a museum of nature, archeology, or history, its real worth will always depend on what it does to peoples' minds and how it makes them feel. If an area contributes to spiritual welfare, if it provides a sense of oneness with forests, mountains, or waters and so enriches their lives, then like tranquillity it is beyond price.

Some find their wilderness in tiny hidden corners where through accident or design man has saved a breath of the primeval. I know of a glen in the heart of this nation's capital where many seeking solitude find beauty and release.

There are some, however, who crave action and distance and far horizons. No little sanctuaries suffice for them. They must know unsettled country, thirst and hunger and weariness that comes only when travelling through primitive regions.

Those who love the north when, after days of paddling and portaging, find themselves a hundred miles from civilization and stand there gazing down some great wilderness waterway listening to the loons, the sound of the waves and, seeing islands floating in the sunset, know a satisfaction no other experience can give.

Those who love the mountains of the east or west whose summits can only be reached by days of climbing over rugged terrain know a similar joy. When camped in some high alpine meadow with snow capped peaks around them, they feel that nowhere else is the primeval on such a noble scale. Here to them is timelessness, immensity, and space, and they come down from their hills, as men have always done, refreshed and ready again for the complexities of life down below.

There are some who feel that only in the great swamplands and flowages of the South, in the Everglades, the flooded cypress stands, or along the deltas and savannas of semi-tropical rivers can one really understand what wilderness means and in a sense they are right for in such places was life evolved.

Whatever their type or wherever they are found, these areas fill a vital need as a balance wheel and a spiritual backlog to the high-speed mechanical world in which we live. It is not surprising that, when urban living and synthetic pleasures fail to satisfy, modern man turns instinctively toward these last reserves to find something that once was taken for granted — the sense of majesty, the mystery of the unknown, the beauty of the primeval.

While it is doubtful if our early ancestors appreciated the intangible qualities of wild country, we moderns seem to be developing that capacity. For the first time in history, wilderness does not have to be conquered or feared. Man can now look at it with joy realizing that within it are not only the secrets of sane living but possibly the spiritual well springs that made him what he is today. The experience of beauty alone, the kind we have been absorbing for a hundred thousand years, sets inevitably in motion ancient reactions that bring about a consciousness of well being and wholeness.

John Galsworthy said it well:

"It is the contemplation of beautiful visions which slowly, generation by generation, has lifted man to his present state. Nothing in the world but the love of beauty in its broadest sense stands between man and the full and reckless exercise of his competitive greed."

If Galsworthy was right — and I am tempted to believe there is much wisdom in what he said — then here alone is justification enough not only for our National Park System but for those areas anywhere in the world. In these places where some of the world's most beautiful areas are preserved, they serve as sanctuaries of the spirit. Here men can recapture the visions that stirred their forebears, visions that have always played a role in the creative genius of the human mind.

In the development of any concept or program for the protection of natural areas, we must ask ourselves therefore whether or not we care enough about the values they represent to make the sacrifices necessary to keep them. It is always easy to allow political or economic pressures to take precedence over such nebulous considerations as beauty or the satisfaction of basic human needs and there will always be those who would exploit the national parks for gain.

It behooves us to be constantly vigilant and to look long and searchingly at any proposals which might change their character in the slightest. In the organic law establishing the National Park Service, the Congress of the United States pledged itself to pass on unimpaired these last primeval areas.

This can only be done, however, when the people appreciate their significance and no longer tolerate any thought of economic utilization. Only when a people are informed and laws are upheld by a conviction that they are right, can such areas stand inviolate.

The population explosion as well as dynamic industrialization threaten nature preserves everywhere. Regions that until now were inaccessible can be reached swiftly by air or by super highways. We must not fail in our engrossment with satisfying physical needs to make adequate provision as well for cultural and spiritual requirements. If we have the courage and vision to protect what we have and to set aside additional lands for this purpose, we will be acting in accordance with a people's profoundest need.

In the days to come when we will be driven as never before by a threat to our very survival, this concept must be vivid enough to capture imaginations. In order to withstand the demand on all resources, the preservation of natural and still unexploited areas must be looked upon as a cultural necessity as important as food, water, and housing. No greater decision faces us, for in our choice we indicate the road we choose to follow. While preserving the final remnants of original America may be only one facet in this choice, it nevertheless indicates a basic attitude toward life and its meaning. So far we have shown we do have an appreciation of the intangible and cultural values of wild country as evidenced by our magnificent National Park System, the wilderness areas of the National Forests, and the wildlife refuges under the Fish and Wildlife Service, and state, county and municipal parks all over the nation. But there is a danger and a real one—the prevalent attitude that we have nothing to worry about as far as our zooming population is concerned or our headlong absorption with the expansion of our industrial complex.

"Surely," say our economics experts, "we can produce all we need to support a billion people and with our technology we will discover new ways of supplanting dwindling natural resources."

No doubt there is some truth in what they say, but the question still remains: is this enough, is it enough to live on an existence level and does not man require more than food, water and housing? Does not life, to be meaningful, require nourishment for the spirit as well?

The prophet Isaiah warned long ago: "Woe unto them that build house to house and lay field to field lest there be no place where a man may be placed alone in the midst of the earth."

Our National Parks, while adequate now, will not be able to fill the needs of the future. Unless we increase them substantially as well as make provision in many other ways, generations to come will not know what we have known. Recognition of what our growing population means in terms of breathing space has drawn comments from leaders everywhere. Luther Gulick in speaking of the rapid growth of our cities said recently:

“We will need and demand more acres of open space within easy reach, more resources for wide, uncrowded, free recreation of mind and spirit. We shall need totally new concepts of recreation guided by our new psychological knowledge matched to urban life and the changing use patterns of our people. We need active programs for some, contemplative opportunities for many, and glimpses of beauty for all even within the confines of the urban design itself.”

We in America believe that our national parks play an important role in providing glimpses of beauty for all and we hope it will be that way for all time to come. We cherish them because they are representative of what is finest scientifically from the Atlantic to the Pacific. We believe in them because we know what they contribute to human happiness. We are pledged to preserve them no matter how difficult it may become. The National Park Service is dedicated to this ideal and the National Parks Association through its program of education hopes eventually to bring about an appreciative public. Since the day in 1872 when Yellowstone National Park was established, the system has grown into a vast complex of parks, monuments, and historic sites and we are proud that our example may have influenced other nations in setting up preserves of their own. What we have done has been possible only because our people believed such a program was worth while. I have faith that in the future the same conviction that has supported the parks in the past seventy-five years will remain unshaken. If the great numbers of Americans making a pilgrimage each year to our national parks are any indication of their concern, then in spite of threats they will survive.

# National Parks in Brazil

by H. E. STRANG

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ANY MOVEMENT TOWARDS the organization of the creation of National Parks naturally finds its origin in a general feeling that Nature must be protected.

That feeling may derive either from sentiment or from logic. In the first case one could count those persons that, having received a heritage of love for Nature, apply their efforts in preserving its beauties. On the other hand we may find those concerned with the practical side of the subject. Whatever might be the case, National Parks are the answer either for poets or for economic-minded people.

It is difficult to point out which group prevailed in the case of Brazil. But I'm inclined to say that in Brazil the Government acted rather through the influence of a very few than as a consequence of a movement of public opinion, or from a general feeling, when creating our National Parks.

The history of the country has been one of constant depletion of its natural resources. Arriving in a New World that seemed impossible of exhaustion, the colonizers of Brazil abandoned their traditional habits of exploiting economically the land and respecting a well-balanced biological cycle.

The abundant natural resources available to that still-small population developed a feeling for getting rich in a short time and made them, as well as their descendants, destroy the resources that Nature had accumulated in the country they had just conquered.

When the discoverers arrived, a long belt of virgin forests stretched along the coast from Rio Grande do Norte to Rio Grande do Sul. Its width varied between 60 and 300 kilometers and was limited approximately by the Mantiqueira Mountains in the south, Espinhaço Mountains in the center and Borborema Plateau in the north. These elevations, intercepting the winds coming from the sea, were responsible for the higher rainfall so favourable to the development of such forests.

In the area that was to be known later as the "forest zone," in the State of Minas Gerais, the forest belt attained its greatest width. It is there that we find today the farms that supply Rio de Janeiro with milk. It is also rather uncommon to find a few clusters of trees!

It is generally believed that the Indians themselves already had the habit of cutting down the forests and used fire as a means of clearing the land they needed. Their actions, nevertheless, probably did not reach the point of disturbing the balance of the Nature to which they belonged.

The same cannot be said of the first Portuguese that came to Brazil. The people, in their pursuit of riches, began to destroy that natural wealth. Whether for firewood or for building, whether for opening new farmlands or for exporting "Brazil-wood," the fact is that those forests were ruthlessly destroyed to the point of annihilation that we see in our day. The zone of the *Araucaria*, for instance, with its exceptional economical importance, in the States of Paraná, Santa Catarina and Rio Grande do Sul, is approaching extinction of its natural cover. However, other characteristic forest regions existed in the country, one of them having been spared more or less intact up to now: the Amazon Hylaea.

It was not until 1876 that André Rebouças, an engineer who was fond of Nature, pointed out the necessity of creating national parks in this country and even put forward two suggestions: the island of Bananal in the Araguaya river and the "Seven Falls" cataracts in the Paraná river. In doing so, he called attention to the example of the action of the United States of America in creating Yellowstone National Park in 1872.

But it took not less than 70 years before the Parque Nacional de Itatiáia was put into existence in 1946 and this dream finally made true!

#### THE CONCEPT OF NATIONAL PARKS: THEIR MEANING AND FUNCTION

The concept of National Parks in Brazil, although not precisely defined, follows the ideas approved by the London Convention of 1933 for the Protection of the Fauna and Flora of Africa.

As a matter of fact, the law that created our first national park in 1937 establishes that the park of Itatiáia shall be a reserve for the study of natural sciences. At the same time, it implies protection of nature, better conditions for visitors and tourists and the preservation of existing nature for the appreciation of future generations.

The local administration of each park is under the Section of National Parks, belonging itself to the Federal Forest Service of the Ministry of Agriculture. Under existing legislation the Section's objectives are:

1. To study and propose the creation of Parks, National Forests and Natural Monuments, either Federal or belonging to States or Municipalities.
2. To develop and suggest the betterment of the system of National Forests and National Parks.

3. To prepare a complete documentation on parks, typical forests and Natural Monuments existing in the country.
4. To organize information concerning parks, forests and Natural Monuments in Brazil as well as in foreign countries.
5. To cooperate with the Governments of States and Municipalities as well as with official or private institutions, in the organization of parks for tourism.
6. To make propaganda of all subjects related to parks, forests and Natural Monuments in the country, through publications, conferences, etc., so as to make them better known and to increase tourism.

On the other hand, legislation concerning each National Park establishes as main objectives for the Administration the following:

1. To keep the flora, fauna and waters in their natural forms, in these areas, for scientific, educational, esthetic and recreational purposes.
2. To further the study of the flora, fauna and geology of the region.
3. To organize museums and herbariums.
4. To facilitate the visits of authorized persons and tourists, giving them all possible information.
5. To send to the central administration all specimens demanded.
6. To help the technical sections of the Forest Service in their experiments, observations and scientific work, as requested.

At present three national parks are under administration; a fourth has been created but is not organized as yet:

- Parque Nacional de Itatiaia (1937)
- Parque Nacional de Iguaçu (1939)
- Parque Nacional da Serra dos Órgãos (1939)
- Parque Nacional de Paulo Afonso (1948)

Besides these, there are smaller parks under the administration of certain States such as the park in Campos de Jordao (1941) in the State of São Paulo, with 5,307 hectares of typical mountain flora; that of Rio Doce (1944) covering 30,000 hectares in the State of Minas Gerais, and Monte Pascoal (1943), the point on the coast of the State of Bahia first sighted by Pedro Alvares Cabral when he discovered Brazil in 1500. In the State of Espírito Santo there is also a wildlife refuge, "Sooretama," covering about 30,000 hectares.

The only National Forest, up to now, is that of Araripe-Apodí (1946), formed by two areas; one (Araripe) in the States of Ceará, Pernambuco and Piauí and the other (Apodí) in the States of Ceará and Rio Grande do Norte.

Recently the Government of the State of São Paulo created a new park covering 12,058 hectares on the south coast, in order to protect the flora, fauna and scenic beauty of the region.

#### THE ITATIAIA NATIONAL PARK

This park covers 12,000 hectares in the mountains that are part of the Mantiqueira chain running parallel to the coast. The peak of Agulhas Negras (Black Needles), highest point in the park, is the fifth highest in the whole Country with 2,787 meters.

The region contains all the features required for a national park. The mass of mountains is largely covered with a particularly rich flora and an equally interesting fauna, both explored by famous naturalists as Lofgren, Homen de Mello, Hubmayer and Holt among many others.

The peak of Agulhas Negras rises from a plateau 2,300 meters above sea level. On the slopes a particularly rare high-altitude flora with many endemisms exists and botanical research can be carried on.

The geological structure of the Itatiáia Mountains is made up of "foiaito," in a mass that is only second to Koala (Scandinavia) in the world, and "nefelinosienito," a rather rare rock in Brazil.

The region presents a sight of rare grandeur and with its high peaks and huge blocks forming deep canyons, might even be called spectacular. Below the plateau a particularly rich forest of big trees, lianas, orchids, mosses, ferns, begonias, etc., covers the mountain-side. Beautiful streams start in the mountains, (where they are often frozen during the cooler months) and form wonderful torrents rushing over their rocky beds through the forest.

The fauna is as rich in species as in individuals. Among the larger carnivores are the jaguar and the cougar or panther (*Felis onca* and *Felis concolor*), about 1.8 meters long, the spotted and the gray cats. Rather frequent at various altitudes are the wild boars, wild dogs, pacas, sloths, opossums, tamanduas, armadillos, snakes, lizards and many batrachians.

But the greatest number of species is found among birds and insects. The variety of hummingbirds is especially notable. The American ornithologist, Ernest G. Holt, found in Itatiáia, during less than six months time, about 200 species of birds.

Mr. T. F. Zikan, the entomologist, points out that from over 10,000 different insects collected in the region, 4,104 are butterflies, 2,523 are beetles, about 1,000 are flies (including the largest in the world). Nearly 300 species of cicadas and bugs, 150 locusts and over 26 species of honey bees have been identified.

In the park are three small but comfortable private hotels, besides several public shelters that are provided free of charge to visitors. Beautiful walks

and riding trails lead to the principal features and scenic overlooks. Exciting climbs can be made to peaks where breathtaking panoramas are enjoyed. Among many auto-roads one, the highest in Brazil, climbs to a plateau which has an altitude of 2,450 meters. A peculiar flora, completely different from all that is seen below, grows there in a sort of lunar scenery. In a tropical country this type of vegetation is quite unexpected.

#### THE IGUAÇU NATIONAL PARK

This park, in the Brazilian State of Paraná and on the Argentine boundary, contains about 205,000 hectares. Its main attraction is the 18 cataracts formed by the river Iguaçu. They have an estimated one million horsepower.

The forest as well as the animal life is considered the richest in southern Brazil. Besides many valuable hardwoods is the so-called Brazilian "pine" (*Araucaria angustifolia*) one of the main sources of timber in Brazil. Along with the larger trees that, as H. von Ihering said, "probably constitute the most splendid and luxuriant aboreal vegetation in the world," one finds an extremely rich flora of palms (including the edible sweet "palmito"), begonias, orchids, bromelias, mosses, ferns, etc.

Birds and insects exist in vast numbers, together with many larger animals such as jaguars, otters, coyotes, "ariranhas", pacas, "cutias", wild boars, deer, sloths, tamanduas, many species of monkeys, some snakes, alligators, armadillos, and other creatures. The ornithologist finds many species of parrots, paroquets, macaws, tucans, hawks, wild ducks, partridges, herons and other typical birds. The rivers are rich in fish.

In spite of being far from the main towns, this region can be easily reached by air. Accommodations are available in a modern hotel built by the Administration near the waterfalls. In summertime some 10,000 cubic meters of water flow over the brink every second, constituting a unique spectacle which is admired by many visitors.

#### THE NATIONAL PARK OF SERRA DOS ÓRGAOS

##### (Organpipe Mountains)

Covering 10,000 hectares and distant only two hours from Rio by car, this park features high mountain scenery marked by the peak called "God's Finger." The region is extremely mountainous, offering excellent opportunities for climbers, and is clothed with beautiful forests. Geologically these mountains are made up mainly of archaean gneiss and some peaks of granite.

The rather high rainfall (2,000 millimeters) is responsible for the luxuriant vegetation. Professional naturalists, as well as anyone interested in nature, are impressed by the rarity, variety and beauty of the plant life. Lianas and epiphytes typical of all Brazilian rain forests are found every-

where, together with begonias, ferns, orchids, palms, bamboos and many other species. The animal population is also rich and similar to that of the Itatiáia park.

The nearby resort town of Teresópolis (five minutes by car) has many good hotels. Shelters and huts for excursionists are located at strategic points in the park, allowing them to spend many days in their visits.

#### THE NATIONAL PARK OF PAULO AFONSO

This park of 16,890 hectares was created in 1948 but has not yet been placed under administration and developed to accommodate visitors. It is crossed by the São Francisco river with its famous Paulo Afonso waterfalls. These are now being utilized for generating electricity. The park is representative of semi-desert northeastern Brazil. Its typical floristic formation called "caatinga" is characterized by very spiny shrubs, cacti and similar vegetation.

