

Voices of the Wilderness

In October 1977 South Africa hosted the first international World Wilderness Congress. Delegates to the congress came from 26 countries; among them were statesmen and artists, scientists and poets, writers and businessmen and indigenous people from many parts of the globe. All came with the intention of expressing their hopes, fears and plans for the world's wilderness on an international platform.

They came to establish a world understanding of the need for conservation, to make known to the public and the administrators of nations the fact that commercial and industrial growth must go hand in hand with the setting aside and preservation of more wild and natural areas. They came to establish a world wilderness order.

Voices of the Wilderness is an edited compilation of papers presented to this congress. It will provide a worthy souvenir of the event for those who attended the congress, but more than this, it gives valuable insight into the problems threatening wilderness and wildlife throughout the world for all lovers of nature and the wild. Among the eminent contributors to the book are Laurens van der Post, (who has also written the foreword) Robert Ardrey, Iain Douglas-Hamilton, Ian Player, Edmund de Rothschild and a host of other renowned conservationists.

Voices of the Wilderness is a handsome volume which should find a place in the library of every nature lover.

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President**

Voices of the Wilderness

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Jonathan Ball Publishers

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Prologue

G. RAY ARNETT
President, National Wildlife Federation

Our chairman, Ian Player, has asked me to summarize this first World Wilderness Congress. I hope that these closing remarks will reflect the tremendous respect I feel for each of you for sharing so much of your goodwill and your co-operation with us all.

Every effort has been made to allow none of my preconceived notions or personal prejudices to interfere with an impartial preparation of this summary. Because of an occasional schedule conflict, it was not possible for me to hear all the papers presented. Nevertheless, every address for which there is a written copy available, has been read. And without exception, each participant has contributed generously to my better understanding of the various subjects under consideration. In addition, the tea breaks, luncheons, cocktail receptions and other non-programmed congress activities have offered me the opportunity to exchange views with many of the thousands concerned world-wide citizens who have attended the congress these past five days. Sharing knowledge and experiences with intelligent dedicated representatives from twenty-six countries has been a most stimulating and educational experience for me.

We have been greatly privileged to have been associated with so much wisdom from such a diverse collection of intelligence! We have heard from research scientists, administrators, politicians, philanthropists, authors, historians, economists, educators, agriculturalists, lawyers, ecologists, biologists, journalists, zoologists, foresters, business executives, an American Indian, an aborigine, an illiterate Zulu game-scout, and others. Everyone has been willing and anxious to share his or her own special knowledge and talents with each of us. How fortunate we are to have taken advantage of this once-in-a-lifetime opportunity to attend the World Wilderness Congress 1977! It is indeed unfortunate that the whole of mankind was not able to participate with us. The world would soon be a better place in which to live if all human beings were direct beneficiaries of the same exposure we have received at this congress.

A general comment that continues to be heard is, "What positive results can be expected from this congress?" Most of us, no doubt, have attended other national and international congresses, conferences and seminars, ad nauseam, only to be disappointed because so very little progress is ever apparent. Much of the same ground I covered thirty years ago is still being ploughed at this congress. It is my conviction that our overall goal is so difficult, so complex, and so varied, we are overwhelmed by the whole, but that is not to say that certain piecemeal objectives are unattainable. Saving wilderness and wildlife through conservation and intelligent planning is some-

what akin to creating another Grand Canyon. Each grain, each pebble of conflict distracting from the grand design must be removed, attended to and eliminated or replaced one at a time. It's a slow process. There is no quick solution; there are no easy battles to be won.

If there were a more expeditious way to accomplish our goals, certainly the combined wisdom of us all, and those who have gone before, would have found a proper solution. In comparison with the magnitude of the task, our productive life-span available to make the slightest contribution is but the blink of an eye. Time can be our enemy or our ally. Will we spend it or invest it? Time is the unique and universal element available to each living thing in exactly the same amount. Each day brings each of us a full bank account of 24 hours – and the quality of our lives depends directly on how we use those hours as they inexorably pass by. Will we spend them in some pleasant, but non-productive pursuit of reminiscing and wishing for what ought to be, or will we invest them in a realistic appraisal of the situation that actually exists?

In order to make any significant progress, may I suggest that we must first accept reality? A reality I can accept is the following quote from the King James version of the Bible, the first book of Moses, Genesis, Chapter 9:

“And God blessed Noah and his sons, and said unto them,
Be fruitful, and multiply, and replenish the earth.”

That we have done. Perhaps too well! God continues his instructions to Noah by saying:

“And the fear of you and the dread of you shall be upon every beast of the earth, and upon every fowl of the air, upon all that moveth upon the earth, and upon all the fishes of the sea; into your hands are they delivered.

“Every moving thing that liveth shall be meat for you; even as the green herb, have I given you all things.”

I accept those instructions as reality, and I choose to interpret them as God giving us responsibility of keeping His house in order. We who are gathered here today, and all of mankind, are the only species on planet Earth who have been given, by God, the ability to choose our destiny. Because of that ability, we can start here today, at this first World Wilderness Congress, to choose, not only our own destiny, but the destiny of every living thing remaining on the earth. It is not within our power to bring back that which is lost; but it is within our power, and it is our responsibility, to perpetuate and enhance, wherever possible, that which remains of our living wildlife resources.

In addition, if we can accept the reality that man's demand for more and more of the creature comforts will not lessen, we can begin to do a better, more effective job of planning our priorities and investing our time. However strong our desires may be for a return to the uncomplicated, peaceful

existence of Chief Seathl, whose philosophy is so beautifully expressed by his letter written in 1855 to the President of the United States, it is, nevertheless, quite apparent to me that we will not, we cannot, turn back the hands of time. So why spend time in this wasteful exercise in futility?

All of us who heard Chief Seathl's letter re-read by Mohawk Indian Princess. Carol-Ann Brant, and Paul Ott, National Wildlife Federation's singing conservationist, were touched deeply by the simple emotional thoughts and respect this wise savage possessed for wilderness and wild creatures. Chief Seathl's love for the land, water and wildlife is shared by us all. None of us is immune to a nostalgia for the past, the "good old days". And no doubt most of us would enjoy the peaceful existence of the unhurried, uncomplicated life of early man that he shared with wildlife within a world of wilderness.

But then came the technological revolution. Those "good old days" have gone. They will not return. However, this does not mean that the future does not have an abundance of good days of a different sort to offer. But we must plan realistically.

Do any of us believe that in this modern world any of her people will forfeit the technological, educational, medical or scientific achievements of the last 100 years? Do any of us believe that members of the western world, or Europe, or Third World countries, yearn for a return to the harsh existence endured by our forefathers? Certainly there are some of us who would find sheer joy and happiness living "in the bush", but as the reasonable, responsible leaders we purport to be, can we expect any appreciable number of individuals within our civilized society to share those desires?

Can any of us honestly believe there are significant numbers of citizens anywhere having available to them air-conditioned, centrally heated homes, colour television sets, sporty automobiles, modern hospitals, supermarkets or shopping centres to abandon these conveniences in exchange for a life in the wilds?

Quite the contrary. One need not be a conservationist, scholar, world traveller, or global politician to recognize clearly that the desire of the world's people is for greater abundance, not less, of the creature comforts. I do not make this statement as a sweeping endorsement of this reality, but I do remind you that the first step toward achieving our goal of a reasonable balance between wilderness and civilization is to recognize and accept that which is obvious or inevitable. Man's desire and demand for more and more technological advancements is increasing, not decreasing, at an alarming rate. To achieve those demands will require an accelerated exploration and exploitation of renewable and non-renewable resources. It will require a change of direction, in some instances, in order to place greater emphasis on the ability to utilize untapped resources such as solar, wind, and tides, and to lessen our dependence on those resources, such as fossil fuels, that appear to be reaching their cul-de-sac.

During my earlier remarks prepared for this congress and delivered on opening day, I stated that our hopes rest with planning. If there is a dedicated interest on the part of enough people who will speak out and speak up

to their own governments, wilderness (or natural areas) of various sorts can be planned into overall land and water development.

If we invest time by looking ahead, it may not be necessary to drain, or to fill, marshes and wetlands, so very valuable and necessary to water-oriented birds, fur-bearers and fish life. If we so determine, unique wilderness areas, virgin timber stands, unspoiled stretches of seashore, and those rare, remaining pockets of the world endowed with pristine beauty may be spared the axe, the plough, the bulldozer, a population explosion, or the pollution that results.

Proper planning, at the proper time, will allow the proper location and development of industrial sites, airports, shopping centres, urban housing and all of the other necessary developments, away from those remaining outstanding or unique natural areas.

If we invest adequate time and attention to realistic planning, we can identify and set aside those resource areas that are most needed by many for a variety of beneficial purposes, not the least of which are inspirational and spiritual.

The accomplishment of these goals will require leadership of a magnitude never before exhibited or implemented within the conservation community. But those leaders do exist. It would surprise me if leaders of that calibre are not in this audience today. We may not know it ourselves, but we will react when the proper situation presents itself to act as a catalyst to move us to that leadership position. Perhaps the occasion and the reward may be only subtle – no headlines, no glory, no financial gain, nothing but the quiet self-realization of accomplishment. But those who have experienced that sensation will attest that there is no greater reward for selfless, dedicated individuals than the secret, self-satisfying knowledge of true success – a job well done.

I can add nothing to a resolution submitted by the congress speaker, Commander L.E. Peyton Jones which reads in part: "I would respectfully suggest that any call for action should be addressed as much to delegates themselves and the organizations they represent, as to governments and other outside agencies. It is, I believe, what we determine to do for ourselves that will be of more far reaching importance than what we request others to do for us." Our goals can best be accomplished by you and me, not by them.

A nucleus of leaders can be found among the participants at this congress. And from this humble beginning can flow a torrent of future leaders whose inspiration, determination and dedication can accomplish achievements which have eluded us so far. This is not to say that our years of past efforts have been for naught. Nor do I mean to leave the impression that our previous work has failed, or that we should leave the task of completion to those leaders yet to come. We must continue the battle together, the veteran and the neophyte, redouble our efforts, and as do-ers and experienced teachers, seek out those who not only share our concern, but also have the ability to lead and direct a planned environmental programme for our developing civilization.

In helping to summarize this convention a committee was established to

prepare a resolution to express what has been achieved, and where we might go from here. It is a consensus that this first congress helped to determine to what extent wilderness preservation has been achieved throughout the world. This first congress has also helped to establish a basis, and has tested the waters to help guide future congresses.

It has been suggested that Wally O'Grady, chairman of the Cape York Conservation Council, Australia, meet with the Premier of Australia to determine if the Queensland Government would be interested in hosting our next World Wilderness Congress in 30 months. Among the reasons for suggesting Australia as the host country is the Queensland Premier's recent proposal for the Cape York Wilderness – a significant action worthy of our good wishes.

I have never been much for committee work. Someone once described a camel as a flea designed by a committee! When Charles Lindbergh completed his historic solo flight, my mother said how remarkable this was for a man to cross the Atlantic Ocean alone. My father replied, "It would have been more remarkable had he done it with a committee!"

But in today's society, committee work is necessary. The Wilderness Leadership Foundation of the United States, United Kingdom, and the Republic of South Africa has agreed to be the secretariat for the committee, and will perform the immense task of organization and continued communications with participants and guests of this first World Wilderness Congress.

The following delegates were appointed to the World Wilderness Committee:

Ian Player, R.S.A.
Dr G Budowski, Costa Rica
Professor G Petrides, U.S.A.
Professor Scott Whitney, U.S.A.
Felipe Benavides, Peru
Edmund de Rothschild, U.K.
Stewart Udall, U.S.A.
Lloyd Brooks, Canada
W R Bainbridge, R.S.A.
G Ray Arnett, U.S.A.

I shall ask Bill Bainbridge to read the resolution prepared by the Congress Temporary Resolution Committee. The resolution he will read is the result of the many resolutions submitted to the committee members in writing by individuals attending this congress. Every written resolution will be appended and entered into the record of these proceedings.

May I sincerely thank you all for having brought this World Wilderness Congress 1977 to a most successful conclusion. A special word of appreciation must go to Ian Player, congress chairman, his staff, and the many, many committee persons who performed in a most exemplary manner during the many long months of preparation. Since it is impossible for me to single out individuals for special recognition without the risk of an unintentional oversight of others, I shall include you all in my words of praise for your partici-

pation, co-operation, dedication and deliberations. May the next thirty months be star-studded with successful achievements, making our long-range goals just that much closer to realization.

Best wishes to you all for a safe return to your homes. May we all meet again in 30 months at our next congress, joined by many others, and filled with enthusiasm and inspiration to continue the good work that has begun.

Preamble to Resolutions

The representatives from many nations at this conference hereby express their recognition of the need for man to come to terms with his environment. An important aspect of this goal is the role that wilderness areas can play in enhancing the quality of human life. This congress commends to the attention of the international community, therefore, our earnest concern that concerted action be co-ordinated forthwith to establish a world-wide understanding of the need for wilderness areas.

As time passes, it will become increasingly difficult to secure wilderness areas for human needs. There is an urgent need for action, lest as man reaches out to grasp the few remaining precious areas they slip through his fingers to be lost for ever.

Man has a remarkable capacity to achieve what he sets out to do, irrespective of the price. Yet the price of his current achievements has been high. His technological, industrial and agricultural development has set in motion processes that tend progressively to destroy the environment upon which he ultimately depends for survival.

The need for wilderness areas is more than a longing for wild places. It is a recognition of the simple truth that man cannot survive if he destroys the equilibrium of his environment.

The wilderness concept goes further than the setting aside of wilderness or nature conservation areas. It encompasses a recognition of the interaction between climatic, physical and biological factors in the overall environment of which man forms a part. It embraces scientific research and also effective communication between scientists and planning authorities. We call on mankind to recognize the importance of protecting the environment. If we, the human race of the 20th century, are not capable of recognizing and responding to this need, we will be faced with severe ecological consequences.

Resolutions

- 1 This congress therefore resolves to call for world-wide action in close cooperation with existing programmes such as those carried out by UNESCO and IUCN and UNEP. Action should aim at strengthening an international system of protected natural areas, of which wilderness areas are vital components. Such a system will require international acceptance and funding.

It is essential for the survival of the natural areas against the burgeoning human needs for energy, raw material and food products, that they be well chosen and sited through careful resource analysis, planning and allocation.

- 2 The action programmes should form the theme for a second World Wilderness Congress which should also review progress, identify future progress needs and review the development of resource management techniques. The several different needs of the industrial, emerging and primitive societies are to be recognized in this regard.
- 3 We commend to this congress the need for comprehensive environmental awareness and the need for wilderness areas, to form a vital part of national education systems. This education should stress the perils of exploding human populations and their impact on resources. The survival of natural protection areas depends upon increasing awareness, especially among young people, of the need for wilderness areas.
- 4 From this congress has arisen a unanimity of thought on man's spiritual, scientific, conservational and recreational needs for wilderness areas, born of a happy meeting of representatives from many lands and walks of life. Represented are philosophers and countrymen, scientists and artists, educators, administrators, politicians and laymen. This unanimity has brought inspiration to the individual delegates who are charged to return to their daily lives, and continue efforts to attain our objectives, each in his own sphere, to influence others and their leaders, as best they may.

COUNCILLOR MARTIN POWELL Former Mayor of Johannesburg

I am grateful for the privilege granted to me to be present here on this most important occasion, both in the life of our city and of the Wilderness Leadership School. May I say that we in Johannesburg are tremendously proud and excited to have been chosen as the host city for this unique world congress. As such it is firstly my great privilege to extend a warm and sincere welcome to our frequent but very welcome visitor, The Honourable Dr Piet Koornhof. We are pleased that he is here with us to open this congress officially, because to us it is an indication of the importance which he and his Government attach to the staging of this international event and to the preservation of wildlife.

I believe that we have with us more than forty of the world's leading authorities on conservation and preservation of wilderness areas – statesmen, authors, poets, musicians and wildlife conservation scientists. On behalf of us all I thank you for having found the time to share with us your experiences and your knowledge. This, particularly in view of certain difficulties, let me assure you, is greatly appreciated. I doubt whether Johannesburg or the Republic or perhaps the world at large will ever witness such a concentration of like-minded people again, and it is thus a great privilege for me to welcome you all to the golden city. I say like-minded because we all believe in the principal objectives of this congress, namely, the need for wilderness areas; the need for adequate legislation regarding the control and establishment of wilderness areas; the need for those who understand the concept to impart it to the general public, so that together with industrial and commercial help, these areas may be established for our sake, for the sake of our children and our children's children, where they can see and enjoy wildlife in its natural surroundings. It is important that modern man, exposed to the daily strain and stress of business and industry, has an area he can go to, by foot or by horse or canoe, freed from these daily stresses, and be able to think and contemplate in natural surroundings, free from pollution, about his role in life.

I wonder how many of you know that Johannesburg itself is indeed a very young city, a mere ninety-one years of age. But tremendous development and achievement has taken place. The city was established on a chain of gold-bearing hills known as the Witwatersrand, the Ridge of White Waters, an area that was teeming with wildlife when the first settlers came here. Because of the development of this area and the adjoining Vaal triangle which stretches over hundreds of kilometres, nothing is left except a small Krugersdorp game park and various small game farms in the abutting areas. Being a keen conservationist and wildlife lover myself, and having had the

privilege and joy of having been on one of the wilderness trails through Botswana, I not only support this congress but believe that the ideals inspiring it will safeguard future wildlife areas.

Again, a very sincere and hearty welcome to the golden city of Johannesburg. May your congress far surpass even your highest expectations.

FATHER NORMAN CLAYTON

O Lord Our Heavenly Father and creator of the endless universe, we come before You this morning amazed at Your promise that You who have set the stars in their courses and painted gorgeously the humblest flower, will be in the midst of even two or three who gather together in Your name. Be with us, Lord, during the course of this week's congress, who have come from far and near to consider man's use and preservation of the splendid gifts You have so abundantly bestowed upon us. We come to You, too, with sorrow in our hearts as so many of the riches we have inherited are spoiled through ignorance, carelessness, neglect and greed. So we ask You to pardon all our shortcomings, and bless every endeavour to ensure that all Your gifts may be conserved for our benefit when in need, and for our delight in every waking hour. May our ignorance be enlightened, our carelessness curbed. May neglect make way for care, and concern for others and generations yet unborn, dispel all greed and selfishness among us. And we come before You, too, this morning with great thanksgiving in our hearts for so many beautiful and valuable things in our natural heritage, for which catalogues are inadequate as they are too numerous and too varied to detail. So we simply praise You for colours and shapes and textures, for pleasant perfumes and joyous sounds, for tastes and for movement, and every pulsating throb of the fascinating world in which You have placed us. And we come before You acutely aware that You declared in the beginning: let Us make man in Our image, after Our likeness, and let him have dominion over the fish of the sea, and over the fowl of the air and over cattle and over all the earth and over every creeping thing that creepeth upon the earth. You created man in Your own image, Lord, just a little lower than the angels, crowned with glory and honour and set over the works of Your hands. In this sublime context, and in the loving awareness of our responsibilities, we dedicate this international wilderness congress, its deliberations, its sharings and its aspirations, to Your greater glory and for the joy and welfare of every man. And in acknowledgement of our ultimate dependence upon You, we sum up all our prayers this morning in the words which Your Divine Son taught us, and say together: Our Father, who art in Heaven, hallowed be Thy name, Thy kingdom come, Thy will be done on earth as it is in Heaven. Give us this day our daily bread and forgive us our trespasses as we forgive them that trespass against us, and lead us not into temptation, but deliver us from evil. For Thine is the kingdom, the power and the glory, forever and ever. Amen.

God bless you and may this congress be a happy and a fruitful one.

IAN PLAYER
Introducing
DR KOORNHOF

Our speakers have come from all over the world and so have many of our delegates, and I am particularly grateful to those who have made the journey to come here. Many I know have resisted political pressures not to come.

We have with us today a unique combination, and I say that with feeling, of thinkers and doers. There are scientists, there are artists, there are statesmen, there are administrators, there is a member of one of the greatest banking families in the world. There are two of the finest authors in the world, and there is a man here who cannot read and write and yet is one of the wisest men I've ever known. It gives me a feeling of great hope for humanity which in this atomic age stands at the crossroads of civilization.

The theme of our congress is wilderness. Once it was plentiful, and now there are only remnants which are facing ever increasing demands. Yet it was in wilderness that the first bonds between man and the earth, of religion, of history, the arts and the sciences were forged, and it is going to be a tremendous struggle to ensure that no expediency or immediate appetite leads to its final extinction. I can tell you that this is going to be a conservation battle that will last long after the lifetime of all of us here, and all that we can do now is to ensure that we put up the most stubborn rearguard action.

I believe the Wilderness Leadership School is one organization that has done its best to give people an experience of African wilderness, and as an example of this I would like to quote something which a girl who went out on trail had to say at the end of it: "I was not only awakened mentally and physically, it was as though I had found a new religion. My spirit soared to its fulfilment and I saw life from a new angle."

There are over 3 000 people who have had that experience. And it is not surprising that she felt this way, for I defy any intelligent sensitive human being to sit at a fire alone at night, particularly in the African wilderness and listen to the sounds, and not be moved. We know that there are some 40 000 prophets who went out into the wilderness and who benefited from it, including Jesus Christ. And I have only one hope for this congress. I hope that a wilderness charter will emerge and that the declaration of this charter will echo around the world, and as a South African I am particularly proud that we are having the first world wilderness congress in this country, because we have much that is good here and yet so many people in the world seem only to seek that which is bad. I believe that those of us who are concerned about wild places and who draw their strength from their existence, can do something that no one else can do: we can present a collective vision to the world.

And now it gives me great pleasure to introduce a man who is not only a senior Cabinet Minister but a really good man who I am very proud to call

my friend. It has been my privilege to know Dr Koornhof, his wife and his sons, and I've taken them into wilderness areas in Zululand, and I can honestly say that as a result of that experience I feel I have grown closer to him.

When we first spoke about the World Wilderness Congress I said, this is the first, and maybe it will be small, but it will become bigger and bigger. His Department of Sport and Recreation has given the Wilderness Leadership School a tremendous amount of support, and I am deeply grateful to him.

DR THE HONOURABLE P. G. J. KOORNHOF
Former Minister of Sport and Recreation, South Africa

It is my very great pleasure, on behalf of the International Wilderness Foundation, to welcome you to South Africa for this, the first ever World Wilderness Congress. We are pleased to be associated with this cause since its objectives are for the long-term good of our land and all our people.

Now I believe wilderness means different things to different people. To some it probably means wasteland, barrenness, remoteness, something vast and still . . . away from the cities and humdrum of towns. To others it may mean a place to retire to . . . to meditate . . . to think . . . to pray . . . to communicate with God. To some it may mean a natural scenic masterpiece, an unspoiled ecosystem, a pristine undeveloped area, nature reserve, national park or a place of rare natural beauty. However, let us not be mistaken. Wilderness, in whatever form we like to think of it, is shrinking; man is solely responsible for this state of affairs.

I am not going to say very much about wilderness as I am no authority on the subject, although it is one with which I am in total sympathy. Instead I'm going to say something about people. I do know quite a bit about people, I can assure you! With wilderness and wild country there is no problem . . . these areas take good care of themselves when left alone and cared for properly. Our problem is with people – too many people. Let us not hide from this fact. It is our number one problem. What are we going to do about it? Sometime, somehow, someone in every country of the world is going to have to be bold enough to make a stand. Someone is going to have to put his foot down and say, "Enough – no more." Every country is going to have to work out its own population policy. If this congress does nothing else, it must call on the whole world to look at this problem.

What is the point of bringing more and more people into our world if already we have shortages of food, of energy, of fuel, of raw materials, and of natural resources? If we want to enjoy peace, harmony, love and life then the world will have to act fast. If we can control man, we can save the wilderness, of this I have no doubt. Our quest is therefore not to save wilderness and neglect man but to control man and save both. For wilderness without man is as unacceptable as man without wilderness.

During the World Wilderness Congress we will have heard about some of the finest wilderness areas in the world. We will, I have no doubt, be inspired by what we hear and will want to seek ways to keep what we have enjoyed for the generations to come after us.

We did not invite our foreign friends to South Africa to ask for sympathy with us at the United Nations, nor to buy support for our political problems. We invited them to South Africa in all sincerity, humbleness, and true con-

servation brotherliness to try together to find the correct solutions to control man and save our world and its wild places.

In the early days of South Africa the settlers plundered the land and its wild animal populations. In their over-enthusiasm they caused the extinction of three large mammals – the quagga, the blue buck and the Cape lion. Today we regret this action – we have learnt by our mistakes. Let us hope that others will learn from our experience.

Some may say there is no place for wilderness in our modern world . . . that progress cannot be stopped and that all land must be used for food production. There are, however, large areas throughout the world that in terms of their optimum land-use capabilities must be maintained as wilderness for high quality water production, for soil conservation purposes and for wild plants and wild animals for their food and tourism potential. We must do everything in our power to keep these areas wild and natural for as long as possible. We must educate and enlighten all our people to a realization that wilderness and natural resources must be conserved (that is, used wisely) if we are to survive as a human race.

We don't need high-powered education for this purpose. We need simple straightforward facts and sound values to be inculcated in the minds of men. We need exposure to nature and the natural environment and we need outdoor experience and participation by young people which will help them understand the problems. In South Africa the Wildlife Society and the Wilderness Leadership School have both pioneered outdoor conservation education for all our people.

We in South Africa are proud of what the Wilderness Leadership School has done in getting many of our young leaders onto the trail to discover for themselves how important wilderness is to us as a people. The school has also brought people from many other parts of the world to experience African wilderness. Today there are wilderness foundations in America, Britain, Europe, all working towards a common aim – the establishment of an international wilderness ethic.

It is unfortunately true that wilderness throughout planet earth is one of the fastest shrinking resources; it is for this reason that the World Wilderness Congress is so important. Whereas there is international understanding and co-operation in respect of the management of national parks and wildlife management, this unfortunately is not the case with wilderness areas. With the notable exceptions of the USA, Canada, Australia and South Africa, the majority of nations have no wilderness legislation or areas proclaimed as wilderness.

At this congress it will be possible for organizations and individuals to get together to discuss ways and means of ensuring that some wilderness and the ability of man to enter it, will remain on this earth.

I want to say from the depths of my heart that I personally believe that wilderness preservation as an ethic and environmental conservation as a necessary practical exercise, are essential. Not so much for the sake of nature, because in a million years' time there will still be mountains, rivers and seas,

but for the development and advancement of man's individual and collective soul.

I know your deliberations will be fruitful and the friendships made here will become most important in the long struggle to ensure that wilderness survives.

I want you to know that in South Africa the world has a staunch friend for nature conservation and wilderness preservation in its widest sense. We are ready and willing to join forces with all countries whose ambition it is to achieve for their people a good quality of life founded on the principles of conservation of nature and natural resources. I should like to quote the following lines by Pringle, a South African poet, which express well the sentiments of a true naturalist:

Afar in the Desert I love to ride,
With the silent Bush-boy alone by my side:
Away – away – in the Wilderness vast
Where the White Man's foot hath never passed,
And here, while the night-winds round me sigh,
And the stars burn bright in the midnight sky,
As I sit apart by the desert stone
Like Elijah at Horab's cave alone,
A still small voice comes through the wild
(Like a Father consoling his fretful Child),
Which banishes bitterness, wrath, and fear . . .
Saying – Man is Distant, but God is near!

I now declare the World Wilderness Congress 1977 as officially opened. May God bless this congress and may much good flow from it.

GARY PLAYER
Thanking
DR KOORNHOF

I play in front of probably a hundred thousand people a week in America and I have got accustomed to it, but to stand up and make a speech in front of a lot of conservationists makes me nervous. But I would like to say what an honour it is for me to be here addressing you people today. There are so many talented people in various fields, people like Mr van der Post. I listened to him on the radio the other day and he was fantastic. Mr de Rothschild, Mrs Oppenheimer, Chief Gatsha Buthelezi ... everyone who has come here today to help make this congress a success ... I'm so grateful that you have come because I know that my brother Ian is so dedicated and not only to his particular field but to his country. I know that on many occasions Ian has been offered a lot of money to work in America, but he had a job to do here in South Africa. He never made any money in South Africa, so he never put money before his job, something not many people in the world do. I feel he has succeeded in his field and I am proud to have him as my brother. As Shakespeare said, the whole world is a stage and everybody plays his part. I am very pleased to be able to play just a little part in Ian's work. My son went on a Wilderness Leadership School trail a short while ago after he was chosen as one of the two boys at his school, and he said the trail was the greatest experience of his life.

In spite of the fact that Ian says I have not had a lot to do with wilderness, I don't think he quite realizes how his influence has helped me in my life. I have travelled more than any athlete that has ever lived, and I do live under a lot of pressure. But thank goodness for the wilderness because when I come home I go to the game reserve and as Minister Koornhof said, you sit there in the quiet of the game reserve and you are grateful for that wonderful silence. I also go to my farm and even though I'm not with wildlife, I'm with horses. I do appreciate what wilderness really means and I think this is the reason that I have been able to compete and play golf and travel so much for so many years.

I would like to thank Minister Koornhof for the things he said about Ian and me and how nicely he welcomed everybody here today, and I too am proud to say that I consider him a very good friend of mine. He is another man who is dedicated to his work, and he is also a man who can take a lot of teasing. Just the other day we had Lee Trevino from America here. Lee has been here before and when we were on the tee, the host of the day said, "Have you met Minister Koornhof?" Lee said, "Sure, how can I forget that guy with the big nose, it's impossible." Talking of Lee Trevino, the other day my daughter said to me, "Gee Dad, Lee Trevino's got a beautiful waistcoat. Can't you get a modern suit, you're such a lousy dresser." I notice that Min-

ister Koornhof, after seeing Trevino, has on a beautiful waistcoat and now I'm going to call him the best dressed man in the low price field.

But to be serious, Minister Koornhof has done so much for sport in South Africa. He takes positive stands when he has to and he is never afraid to say what he believes, and I am sure that all South Africans, whether they are great liberals or great *verkrampes*, whether white or black, appreciate his honesty. I don't know how honest politicians all over the world are, but I can tell you that Minister Koornhof is honest. The other day he said the facilities for some of our sportsmen were not as good as they should be and he is right, and he is doing things to try to improve the situation. I like the way he backs up his words and I am sure that we are going to go from strength to strength in sport. We are very proud to have him in such an important position. He is a competitor; I played with him in Port Elizabeth and I have never seen a man try so hard on a golf course. His handicap is 14. He must be on the handicapping committee himself because I have never seen a fellow who was more of a rogue: he played to a ten that day, four under his handicap. I lost one golf ball to him and he reminded me five times that I owed him a golf ball.

I would like to take this opportunity to thank all of you, not only for coming to this world wilderness congress but also for your kindness to me when I have visited your countries. It is true that I have sometimes had to face hostile demonstrations because I am a South African. The demonstrations were unpleasant but then you are never a man unless you can accept something in adversity. You can always accept things when the going is easy.

Perhaps you will leave South Africa with some bad opinions but you will go back with some good ones too. You will see that as a people we are facing various kinds of adversity but good South Africans, and there are many of us, are doing things to make this what I think is the greatest country in the world.

Foreword

The Other Side of Silence

LAURENS VAN DER POST

The World Wilderness Congress at Milner Park in Johannesburg in 1977 was one of the most remarkable occasions of the many of its kind I have attended. I know of course that, as a native of South Africa, my judgement could very easily be biased, and I would not have asserted this so confidently at the beginning were it not for the fact that so many of the distinguished delegates who came from all over the world to attend it – particularly the remarkable American contingent who, heaven knows, have more reason to be reductive through over-exposure to conferences and congresses than any of us – had not been even more stimulated and impressed by the event than I, had repeatedly delivered themselves of similar evaluations far more emphatically in public.

There were, I believe, many reasons to make this so. There was, for instance, the imaginative way in which Ian Player and his associates had conceived the conference, and the courage with which they had compelled it to happen when all the odds were ranged against them. Pericles had a moment when his beloved city state of Athens, to which the world is still to this day deeply in debt, faced disintegration from self-doubt, division and corruption within, and threatened invasion from without. He rebuked his fellow citizens for their fears, reminding them that only courage gave men the one worthwhile freedom – freedom from fear – and exhorted them, accordingly, to go delivered from fear and become once again the education of Hellas. Without this kind of courage, present at the conception as well as the birth of this conference, and the conviction that wilderness was the one school of education that could save a threatened and delinquent world from itself, the conference could not have been the unique occasion it turned out to be. Courage and conviction, embattled as they were throughout the conference as much as they had been during the long months of preparation that preceded it, have a knack of heightening human perception as few other elements in life can, and perception, once heightened in the human being, changes him, consciously or unconsciously, enlarges his personality and, whether he likes it or not, presents him with a challenge full of a potential enrichment of his being. There was no doubt in my own mind that this is precisely what the conference did, not only for thousands of my countrymen, but also for the initiated and relatively immunised delegates from overseas. This accounts, I believe, for the crowds day and night at Milner Park. And they did not come because of exhortation in their daily newspapers. Although radio and television responded on the whole admirably to the quality of the event, I was shocked by a Press that was either indifferent or, when not indifferent, uncharacteristically superficial and flippant, and at the best

perfunctory in its approach to what was happening at Milner Park. It seemed to me I had never seen the Press so obsessed with politics and so oblivious of the truth that we were living in a world increasingly disillusioned with politics because politics had become its own highest value and ceased to be an instrument of something greater than itself, as it has always been at moments of creative evolution and true change in human affairs. What gave the conference such an urgent and immediate meaning full of practical import for the future was something utterly different. Its main concern was a complex of values that transcends by far the transient and bankrupt dimensions of contemporary politics and its obsequious deference to expediency. It was concerned at an hour much later than even the most aware among us think, with a challenge which, if not met fully and honestly now, could within decades leave us in Africa with a world so eroded and over-exploited as to deprive even politics of any ground worth quarrelling about. In the sense that by implication it clearly demonstrated the inadequacy of politics to deal by itself with the abiding issues of life, the conference could not have been better timed. Indeed, for me personally one of the most revealing of many lessons it produced was the demonstration of how great were the numbers of my countrymen who still cared passionately more about a life of meaning and a state of being capable of natural increase, than about the purely political obsessions of the moment. However valid they might be in a secondary dimension, they should never have been allowed to exceed.

The variety of these values and diversity of attitudes all directed to the same end are obvious from the papers produced in this volume and need no emphasis or introduction, but what does require some representation are the great imponderables of the occasion and the atmosphere of intangibles which cannot be fully expressed but only hinted at. Inapprehensible as they were, they presided at every dimension of the meetings between speakers and audience at Milner Park, and produced the extraordinary union of mind and purpose which marked the event. A union of likes is not really union but conformity and a source of weakness. A union of diversity and difference is the union which is strength, and such a union was achieved at the conference, very largely because of these indefinable imponderables. It is for this reason above all that rather than write a formal introduction for the papers which follow, I have preferred to try to offer some testimony of the dynamic atmospherics of the occasion as I attempted to express them in an unscripted talk on Wilderness Awareness which I gave one evening at the conference.

I could not, I am certain, have talked in this way anywhere else than in Africa, and I stress this here because it redirects attention to another of the fundamental factors which made the conference so unique. It could not have been the enriching experience it was if it had been held anywhere else except in Africa. In spite of the fact that Africa is increasingly invaded, as the rest of the world is, with the frightening forces of a technological barbarism which passes itself off as civilization, Africa still evokes by historical association and the physical nature of itself, even in so vast a city as Johannesburg, all that is symbolised in the imagination of man by the garden at the beginning, the wilderness from which modern man appears to have been so irrevocably

expelled. Not a single person among the hundreds of my fellow countrymen who came to these meetings did not bring to it a living nostalgia, a great and active new hunger for this wilderness because their own particular expulsion from it was most recent and their memory of it therefore most vivid. Moreover, most of the delegates from abroad had been fired in their love of wilderness through direct contact they themselves had had either as hunters or conservationists with what is left of wilderness on our continent. So although the time and the place were contained in a great city, there was, by association and memory so persistent and powerful, an intrusion of this lost natural Africa, the greatest keep of natural life and wilderness the world has ever known, that it was as if we were gathered around a campfire and talking as men do only on such occasions at night in Africa.

Perhaps I can make the point more specific by quoting something I wrote for myself to ensure that I never forgot what I and many others far greater than myself owe Africa and the wilderness in this regard.

"There is," I wrote, in my account of *Jung and the Story of Our Time*, "a kind of conversation I have hardly ever experienced except in Africa, when one is alone in the bush or desert with little to diminish the impact on one of that great swollen sea of land, its skies, winds and clouds and abundance of vivid and infinitely diversified natural life. Subjects come up fast in one's senses and the voices of one's African companions, as a rule pitched singularly low out of the instinctive reverence induced by that natural surround, so one can, simultaneously, overhear the intimate conversations of nature. The voice of the lion; the intense cough of a leopard; the sound, like a pistol shot, of an elephant tearing a strip of his favourite bark from a tree; the night plover's sea-pipe call; the bush-buck barking to keep up its courage; a baboon whimpering in some unfathomable nightmare of the tangled bush; the croaking of frogs by some precious star-filled water; the sustained Gregorian chanting of the cricket priests of the night; and, overall, the smell of the incense of the devout earth evoked by the first fall of dew."

And as if determined to add to this aboriginal stirring below the measured and impervious concrete crust of metropolitan appearances, nature, by what seemed no idle coincidence, intervened itself and released a great thunderstorm of the kind only Africa can raise, and sent its cohorts of clouds, gleaming all purple and gold, sworded, lanced and arrowed with lightning and swollen with rain, to subdue both city and metropolitan resistances which had exceeded their proportions, and reduce all to what is within the deed an act of universal meaning, a mere wayside camp of concrete tents that could shut out the night but could not conquer the natural life-giving mystery of which even this vast tempest was only one microcosmic manifestation.

Watching the storm, I found myself profoundly stirred because it suddenly seemed charged with the natural symbolism of the significance of wilderness to life and the creative evolution of being. Lightning has always seemed to me an image of awareness imperative, thunder of the Word that was at the Beginning and was with the Creator when the waters first were parted and a natural order came out of chaos and old night; rain that of

creative doing seeking union with our great Mother Earth out of which all forms of life and their increase had to come. All of wilderness awareness was for me in that moment and, not surprisingly, there came to me a verse from *the* poet of wilderness because no other poet ever had so keen a sense of wilderness within man and wilderness without, and the mysterious, interdependent need of the one for the other in order to create a world without end. The poem burst into my imagination with such force that it resounded almost as if it were being read to me by the thunder itself. It was from "Inversnaid" by Gerard Manley Hopkins for whom the whole world was "charged with the grandeur of God"; who thanked the Creator for "dappled things", "skies of couple-colour", "fresh fire-coal chestnut fall", "finches wings"; and who recognized that the "mind had mountains, cliffs of fall, frightful, sheer no man fathomed". And these were the lines:

"What would the world be, once bereft
Of wet and of wildness? Let them be left,
O let them be left, wildness and wet;
Long live the weeds and the wilderness yet."

All in all, it was a kind of association one never experiences in Europe and that I have certainly not encountered at international conferences before. Although I was watching the storm in comfort from my room in a large, luxurious and impersonal modern hotel, I felt I was only technically there and, in essence, following some wilderness trail of my own. So that when the time came for me to address a packed audience close on 2 000, I tried to put it all in words more or less like these:

I have been left with a difficult task of talking to you about wilderness awareness, and I think it is very important first of all to realize how imprisoned and diminished modern man has become in his increasingly metropolitan context. In this very inadequate and overpowering context, he has coined a word for awareness: consciousness. Rationalists who are in command of the scene tend in general and their logical positivist disciples in particular to tell us that this consciousness is limited to what we can articulate verbally. Anything that we cannot articulate in this fashion they hold is not worth knowing. Well, of course this is nonsense because life is much more than we or any genius or combination of geniuses can ever articulate. We all, even the least of us, are aware of far more than we can ever express, know far more even than we allow ourselves to know. Life is much more than we can ever put into words. We need music, we need poetry, we need painting, we need all the manifestations of reason, we need that sense of direction men call religion to serve it, and when we have put them all together we have not yet really expressed fully what is meant by this extended form of consciousness we call awareness.

And in particular we are aware of the importance of what we know inexpressibly as well as don't know when we are restored to ourselves in the wilderness, and that perhaps is most important to all because it prevents us from exceeding our natural proportions, and keeps our knowledge humble and free of the contemporary arrogance that makes it oblivious to its needs of increase.

I have here something which I read only the other day which hints at the difficulties of defining this kind of awareness much better than I can in my improvised haste. It is something from a very great novel, perhaps the greatest English novel ever written. It is a novel by a woman called George Eliot. In *Middlemarch* she gives an indication of what happens to human awareness in the wilderness of suffering where the human sense of being and inter-communication is stretched to the utmost limits of consciousness and the walls of conscious perception are, as it were, suddenly rendered translucent and strange improbable things not only seem to shine through them as we live there on the frontiers of what we know, but occasionally very odd phenomena come over the top of the wall at us. I myself have immense respect for the natural walls of our sensibilities, and yet I cannot ignore the strange things that come from time to time over the top of the wall, because they seem to me to prevent the great mysterious universe from stifling us with its weight of the unexplored and the unknown, and to transform mystery into living and active wonder. This feeling of mystery transformed is an enlarged form of consciousness only to be experienced in the awareness of wilderness without combined with wilderness within.

And this is what George Eliot clearly hinted at through the almost unbearable cry of agony of her heroine in *Middlemarch* when she explains: "If we had a keen vision and a feeling of all human life, it would be like hearing the grass grow and the squirrel's heartbeat, and we should die of that roar which lies on the other side of silence."

Literally taken, this cry might sound like mere exaggeration expected in moments of unbearable suffering, but taken symbolically the statement that "we should die of the roar that lies on the other side of silence" is full of meaning because the dying there refers not to a physical death, but to a death of what is unreal and limited in the modern human being and prevents him from putting his own sense of meaning in the universal evolution of order of all natural things. It would be a dying in that sense which is necessary in order to be reborn into a greater expression of life than one has been able to achieve before, and one is particularly open to the reality of this when one is utterly alone in a natural area where no other human beings have been before as I have on occasions had the privilege to be; and one suddenly feels overawed and humbled as if one were looking at the original blueprint of creation, and at times seeing the world of animals and insects and plants as they were just delivered warm and magnetic from the fingers of whoever had made it all. Indeed, one is so close to a universal feeling of belonging that at times it is almost as if one is part of the act of instant creation.

Now before coming here tonight, as I watched this wonderful thunderstorm break over the city, and wondering how I could indicate to you what we mean by wilderness awareness, I found myself startled saying, "Dear God, here we have nature coming to show us all what is meant by wilderness awareness. I just have to let the lightning and thunder lead me and do what I do in the physical wilderness – follow nature, follow what it evokes in my own mind, and see where it comes to."

And the lightning and thunder straight away led me to a prison cell in

Java where I was in the hands of the Japanese, and to a nightfall in which I was convinced that it was my last night on earth. I had been told not long before that I was to be executed on the following morning. I was ill, in great physical pain which I will not bother to describe except to say that I had been treated in such a way that I was at the end of my own physical resources, and suddenly in the midst of all this, there broke as it did this very evening a tremendous thunderstorm over this prison in which the Japanese held me, and the rain came down. I stood on tiptoe hanging on to the sill of the narrow window of my cell. I looked out, and it was lovely to see how both the rain and the light went purple with these great flashes of lightning, and to hear what great music the unbelievable thunder made in my ears. An immense feeling of relief went through me. I was not worried about the next morning at all. I was indifferent to my own need because all personal and other considerations were dissolved in the thought: "My God, now there is something that man doesn't control; that storm is something the Japanese do not control; there is the testimony of something greater than us all, in charge of a wider plan of life than any we can conceive."

And this feeling was the kind of liberation of which the mystics of all nations talk in terms of a living universal bondage wherein alone the human being is free. I have never felt so free, and I have never had so good a sleep as I slept that night to the music of the storm, and, as you may have noticed if you look closely, in spite of the sentence of death which had preceded it, I am still alive today. Somehow as far as I was concerned on that occasion, this extended kind of awareness had worked and worked well. And from there on, I followed the thunder naturally to an evocation of what had led me to Java, and I remembered an occasion where I was dropped into Java and came down in virgin jungle near the great volcano of Krakatoa. I fell up to my neck in moss, and can you imagine moss and a forest so still, untouched and undisturbed that one could stumble along some faint buffalo or tiger track, to fall into moss up to one's neck between the roots of great trees. On that occasion it was raining too, and it rained for more than forty days and forty nights with barely an interval and even I, who love the rain almost more than anything else in life, was so depressed by it that I thought I had better hasten to find an ark somewhere. But when the rain ultimately ended and I came out of the forest, I discovered that Fate had arranged it so that we emerged on the edge of a country still inhabited by the original inhabitants of Java.

They are not at all like the people who pass for Javanese these days, but an aboriginal people who were spiritually extraordinarily akin to our beloved Bushmen. They were the remnants of a people called Badoeis, and to give the imperial Dutch their legitimate due, they had respected these aborigines of Java so much that they had never tried to impose their own rule upon them. They had drawn a sort of line around their country and never even sent a tax inspector or doctor in among them, but left them instinctively to be themselves. It was as if, out of what these aborigines were within themselves, a certain invisible power came, inducing feelings of awe and reverence not even among the conquering Dutch, but among the sophisticated Javanese who are of a mixed mainly Malay and Hindu origin. There are many complex

layers of culture and race in that lovely island. For instance, as you go back into the history of Java, you strike a Buddhist layer, followed by a Hindu layer, and then a Muslim layer in confrontation with a Christian Dutch layer, but below all these layers there lies this ancient pagan Badoeis layer. They were, as far as I could make out, animists, to use a simplification inevitable in so brief an occasion, and they lived, as it were, guarded by five active volcanoes and a jungle so wide and rich that it broke like a green sea over the highest hills and up to the edges of the volcanic mountain tops. They could not have been kinder and more friendly disposed towards us, but instinctively I felt that we might contaminate them, and even more, draw them into our fate to such an extent that the Japanese, whom I realized were sooner or later to overwhelm us, might make them pay very dearly for it. I knew that I had to get away from them as soon as possible, and while my small unit was regrouping, I went out on patrol one morning with only one Badoeis as a guide. I thought it important to make it as peaceful a patrol as possible; I didn't even take a pistol with me and only had a light geological axe which I had borrowed from the prospector's dump nearby.

We set off along a very narrow track through the densest of jungle, and as the light broke and it became clearer, I noticed that we were going through a bamboo forest with great soaring bamboos so close to one another that we could not possibly get off the track should we wish to. And just as this realization appeared on the verge of becoming a kind of claustrophobia, straight down this track walking slowly towards us came an immense tiger. And perhaps it is important that I should stress here, dramatic as it may sound, that I have not thought of this incident for years and would not have done so tonight if it hadn't been for the lightning and thunder in the sky outside. The tiger instantly stopped, glared, and sort of snarled at us, and I thought, "Well, we've had it." But the Badoeis, who was in front of me, immediately went down on his knees in an attitude of graceful, rhythmical prayer and began praying to the tiger in the words of a language I did not know and in which I only recognized the phrase 'Tuan Tiger' - 'Lord Tiger' - and gradually the tiger grew quiet, his tail stopped thrashing, first the snarl and then the look of aggression vanished from a face that soon was full of resolution and light, and a moment even came when the ghost of what I can only describe as a smile flickered over the tiger's face, and the tiger turned about and walked off in the opposite direction.

Now that shows, I believe, how it is possible out of a true wilderness awareness to communicate with animals and to get a mutual recognition of kinship in the universe from them and so to a far greater extent than is thought possible. In the humility born of this form of awareness, I have found that it is possible that one can give and receive at this level even from animals who are far more remote from us than the tiger, like the rhinoceros who goes back to our prehistoric past, as Ian Player can tell you far better than I. And this was my first great lesson from the Badoeis as it had been from the thunder and the lightning, of an awareness that encloses and protects people as helpless as the two of us were that morning in face of the tiger, more effectively than any contrived armour can.

And from the Badoeis aborigines in Java my mind went naturally on to an occasion in the Kalahari Desert just after the war, when I was doing a systematic exploration of it for the British Government. I was about to go out as usual at sunrise one morning when one of the aborigines of the desert, the Bushmen trackers who were with me, suddenly broke apart and went and sat away and alone by a certain dense kind of thorn bush. I stopped and waited, somewhat impatient to get on, but he just sat by the bush and it looked as if he would go on sitting by the bush for the rest of the day. I asked my Bushman interpreter: "Why is he still sitting in the bush? Can't you go and call him and tell him we have to move on?"

My interpreter answered, amazed that I could suggest anything so outrageous – he, like all of them, thought of me as a singularly uneducated person, uneducated, that is, in the ways of the desert: "No, I can't do it," he told me severely. "He is doing very important work."

"What is he doing?" I asked.

"He is listening in to his tapping," the interpreter replied.

I asked immediately, "Well, what is this tapping?"

My interpreter had been stolen from his people in the desert as a child and sold to people who farmed on the remote edges of the desert, and knew a few elementary facts about our technological ways. To help me out he drew a comparison and said: "Don't you know we Bushmen have a tapping within ourselves that is like your telegrams? We have telegrams inside ourselves. This tapping tells us of things that are still to come, things so far away that we cannot see them yet, and that man there is listening in to his tapping to see where he must take us today."

And then, to make quite certain that I had understood the message, he said to me: "You know only a fool will not listen in to his tapping when he hears this tapping starting up inside himself."

I felt like telling him that the world I knew was full of fools who never listened in to tapping of that kind, who didn't even know that this tapping existed, although in this invisible mechanism of the tapping within the human being, of which the Bushman was speaking, we have a hint of inspiration which produced the electrical tapping we call morse coding that enables us to communicate with one another from the ends of the earth. The world was full indeed of people who didn't even know that this tapping existed, and I was back at the fundamental point of departure of how much more we know than the world in which we live allows us to know or even suspect. And this is one of the first characteristics of wilderness awareness, this discovery that when you are alone and apparently helpless, some other kind of knowledge, which is greater than the proved and tried knowledge of experience we carry around within ourselves, comes to our aid.

I took this phenomenon of the tapping very seriously after that and studied its manifestation among my Bushmen companions as closely as I could. I found that their claims for the importance of the tapping could hardly be exaggerated and had many striking instances of how accurately it worked for them. I found that they would listen in to their tapping and as a result take me a most unlikely way, and we would find the antelope we badly

needed for food at that moment. And although I smiled, I was not certain I had any right to smile when they told me that there were experts in listening in to this tapping who could follow the progress of a flea through the feathers of an ostrich, invisible on the far side of a dune below which we had pitched our camp.

The final confirmation of the fine art to which they had developed it came to me when I started to move out of the central desert. It was at a time of terrible drought, the kind of drought which compels one to share the agony of the earth like a sickness and hunger within one's own blood. The night before the relevant morning, we had seen, just below the horizon, the first flicker of lightning from an advance of thunderclouds that might bring rain, and it was fantastic how, in the morning, the desert was transformed. It had looked stricken and empty except for the vultures in a blue of steel overhead, but now in the first light of morning the exhausted earth was full of game moving in the direction of the lightning. The lightning obviously had evoked something in the spirit of all this amazing and varied gathering of animals that the lightning and thunder evoked in me tonight. I found in one pan a herd of what I estimated to be some 40 000 springbok, all moving in the direction of the lightning of the night before. It seemed to be an incontrovertible demonstration of how nature had a system of radar and of direction and redirection all its own, as I am certain it has for all of us and all forms of life within its keep. Sooner or later it will see to it that we all move once more towards the rain.

We had not gone far that morning when my interpreter stopped me because he said the tapping had started within him. I was in a hurry and anxious to get on and out of the desert at last, but by this time I had learned to take this sort of thing seriously. We stopped there and then by some trees which had very little shade because they had no leaves left on them, and there was only grass so sparse and thin and ghost-like that their shadows, like the shadow of the trees, seemed only darker forms of sunlight. As we waited there, my exhausted companions too went to sleep, but I lay there strangely restless until my interpreter came over and whispered to me, "Yes, I can hear what the tapping is saying. You were right to stop here. There are people coming, people in great trouble. I can feel it from my tapping."

And an hour later a group of Bushmen who had also turned about in their desperate tracks in the night to go towards the lightning were coming towards us. We saw them coming out of the blur of the waves of heat of the day, staggering, and clearly near the end of even their great resources. They had no water, they had no food, and had not found any underground roots or bulbs to eat for days. I have never seen people, excepting starving Japanese prisoners of war, so near their end. And had it not been for this tapping, we would not have stopped and so been enabled to give them water and to go out and shoot an antelope to give them for food.

That night they made a little camp on their own and, as always, I respected their privacy and made our own far greater camp well away from theirs. But when the night fell, I felt compelled to go over to their camp and

make certain that they were indeed recovering as fast as they had appeared to be after their first sip of water and bite of food in the morning.

My interpreter and I walked over slowly through the dark. It was a black, moonless night and the stars were unusually clear and bright, and it was very silent and still. It was this kind of silent silence of which George Eliot spoke as being on the frontier of the roar of meaning that lies beyond it. We walked softly, and had gone little more than half the distance between our camps when my Bushman companion stopped me, hushed me, and pointed. By this time my eyes were so accustomed to the dark and the starlight was so brilliant that I saw, outlined against their shimmer, the figure of a Bushman woman who appeared to be holding up a child, high above her head, up to the stars.

"What is she doing?" I asked my companion in the whisper that is instinctively induced in one by the night in bush jungle and desert.

He answered with as reverent a whisper: "That is a mother with a child that is very new, and she is asking the stars up there to take away from her child the heart of a child and to give it the heart of a star instead."

I asked, "Why the heart of a star?"

"Because," he said, with a hint of impatience at the ignorance which I have already mentioned, "don't you know that the stars are great hunters? If you listen you will hear their hunting cries up there."

We listened, and I heard star sound as I was not to hear it again until some fifteen years later in the icy stillness of an early spring night in the Siberian forest. As we listened to this star sound, like the murmur of the sea of night itself, he asked me with anxiety, as if the question touched on matters of ultimate religious significance:

"Don't you hear what they say?"

"I do hear the sound, but what is it precisely that they do say?" I answered.

"They say 'tsa'. Can't you hear it?"

And then I had it and I thought, "Dear God, but this is the sound we have always used to set our dogs going after game. I have been thinking we invented this word 'tsa' and there it is, this word, which all of us raised in the country used in Africa to this day is a word that we got from the Bushmen and the Bushmen got it directly from the stars."

This is the sound they continually make when we allow ourselves the silence to hear it and this is the proof that there is intercommunication, not only between all living and growing things on earth, but also between man and the stars.

These then are some intimations, some examples from two of the oldest people in the world of what wilderness awareness can do to one. I have many more, but I have no time to present them to you tonight. But these two, I hope, are enough to indicate what wilderness awareness does to one. It can put modern man back into a feeling of all-belonging again, a feeling in which the despised and rejected aborigine is so rich and in which we, in the midst of our technological abundance, are so poor. It is strange how desperately and increasingly in the sprawling cities modern man feels abandoned and

alone. I have never felt so alone as I do among the millions in London. I have never felt alone yet in the desert or in the bush and even the sea, because in those dimensions one always has company of animals and plants and stars, and one is always observed. And this, I would say, is one signpost of the difference between the person who has a wilderness awareness like these humble aborigines I have mentioned and the so-called civilized man. The civilized man believes he knows. But in the wilderness you are aware not so much of a feeling that you know as the feeling that you are known. You always feel that you belong and through this belonging have a feeling of meaning which modern man, impersonal and unknown within himself has lost.

None of us feel any longer that we belong, none of us feel that we are known any more unless we turn to the wilderness again. Turn to nature and ask from the stars for the heart of a star, and you will be known again as you have never been known before. Something of all this is a minute measure of what wilderness awareness is about. But let not I, but the poet of wilderness I have mentioned sum up in a question that answers itself, where this awareness leads us to.

In "Ribbersdale", Gerard Manley Hopkins has it:

"And what is Earth's eye, tongue, or heart else,
Where else, but in dear and dogged man?"

We have to become once again not only the voice and the reason of this grievously wounded earth of ours, but its healer and defender with a reverence for all that is defenceless and vulnerable, and so restore it to the totality which a spirit quickened by wilderness awareness is compelled to seek if it is to be as healed and whole again at the end as it was once in the beginning.

*Selected Papers
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How Can You Buy or Sell the Sky?

CAROL-ANN BRANT

I was born on the Thayendanega Indian reservation in Ontario, Canada. I am a direct descendent of Chief Thayendanega who lived from 1742 to 1809. Under his Christian name of Joseph Brant he led the six nations of Iroquois during the American Revolutionary War. During that war he allied with the British and was commissioned a captain in the army of King George II. Chief Thayendanega was a man of exceptional abilities, high character and strong moral convictions. He combined the fierceness of the woodland Indian with



Dr M. Ebedes, State Veterinarian of Stellenbosch and Princess Carol-Ann Brant.

the good manners of the English nobleman. In addition to being a brave warrior, he was a communicant in the Anglican Church. Many historians have described Thayendanega as a true statesman of the Indian nations. In 1775, Thayendanega made a visit to England and was greatly applauded by the British. His portrait was painted by both Romney and Gilbert Stuart. This warm relationship with the British Crown led to the granting of lands to him in the region of the Bay of Quinte, where I was born.

The Mohawk nation has never signed a treaty with the American government and because of this its members possess a unique citizenship. The Mohawks are citizens of the entire North American continent.

As such we are accorded the privileges of unfettered transit between all the Commonwealth countries and North America. The Mohawk nation has lost the vast lands it previously commanded. Once my people inhabited that large area of the North American continent which now comprises the north-eastern part of the United States and Canada. At the present time, there are just a few more than one thousand Mohawks left. I am registered as 1 039. I can truly say, "I represent a vanishing race."

Three hundred centuries ago the ancestors of the North American Indians began making their way across the Bering Straits from Asia to North America. They came in a succession of small groups who lived off wild game and vegetation as they moved along. The passing of countless generations gradually dissolved the common past of these wanderers and distinct new cultures began to develop. At the time of the first European contact there were some five hundred different tribes, each physically, socially and culturally different from each other speaking some 2 200 languages or dialects. There is not the slightest resemblance between the New York-Iroquois and Brazil-Cayapo, or between Montana-Crow and Mexican-Maya.

To a large extent, North American Indian cultures reflect the environments in which they were shaped. We adopted traits and techniques necessary for survival. The different economies gave rise to diverse customs and to a variety of social, religious and political systems.

This kaleidoscope of cultures makes "Indian-ness" little more than a figure of speech. It is more aptly a modern reference to traits by which we today retain recognition for ourselves as Indians. The life of almost all Indian societies was coloured by a deep faith in supernatural forces. This belief linked all human beings to all other living things. Each animal, each tree and each manifestation of nature had its own spirit with which the individual could directly establish contact, either through his own spirit or that of an intermediary. The combined total of the peoples' spiritual powers was believed to be the unseen force that filled the world. It was the sum of this force that shaped and directed life. The Iroquois call this life force, "Orenda". Many North American Indians hold in common certain fundamental ideas. The land and its produce, like the air and water, are free for the use of the group. No man may own land as personal property and bar others from it. A tribe or village can claim certain lands as its territory for farming or hunting, but it is held and used communally. Some tribes regard the earth as mother of all life and believe it impossible to sell. For you do not sell your mother. These concepts have persisted through the years and remain strongly believed among many Indians today.

At Taos Pueblo, New Mexico, in the spring, numerous Indians still might take the shoes off their horses and themselves and walk about in soft-soled shoes for they believe the earth is pregnant and her body must not be harmed.

There are still North American Indians who resist the use of modern ag-

ricultural equipment, believing it will slice open the breast of the mother earth. Yet Indians were superb farmers. Almost one half of all the crops cultivated today were introduced by Indians and unknown to the world before 1492. Potatoes, corn, manioc, which is now a staple food in Africa, tobacco and some eighty different domesticated plants were all originally cultivated by Indians. Modern medicine owes a debt to the Indians as well, for the coca plant, curare, cascara sagrada, and without the pichon bark the world would not have quinine.

Generally, most American Indians have respect if not reverence and awe for the earth and all of nature. Living close to nature and its forces, they strive to exist in balance with them. If harmony with nature were disturbed, illness, pain, death and other misfortunes might result. Life after death is regarded by many as the continuation of existence in another world where everything is easier than before death. However, the term "happy hunting ground" is a white man's invention. Misinformation has prevailed concerning Indians, casting them as savages and bestial warriors. Indian warfare was often no more savage than the Europeans introduced to this hemisphere and waged against the indigenous people. For instance certain groups such as the Hopi Indians were among the most peace-loving peoples on this earth. Long before the coming of the Europeans the territory known as Eastern New York State, the St. Lawrence river valley and areas of Vermont and Quebec were inhabited by peoples who called themselves Kannienkehake or the People of the Flintstone.

English-speaking peoples called them the Mohawks. They belonged to a six nation confederacy consisting of the Mohawks, Senacas, Oneidas, Onondogas, Cayugas and Tuskaroras. It was known as the Iroquois Confederacy; however, they called themselves the People of the Longhouse. This is often the type of rectangular bark-covered dwellings used by the people. Symbolically, all members of the league were considered as one family living together in one lodge. The Mohawks were known as the Eastern Doorkeepers of the Lodge. Tribal and family bands were very strong. Clothing was made of skins usually fringed in order to move through the woodlands without undue noise. For that reason also, moccasins were worn. When you step on a twig in moccasins it will not break – thus making the wearer blend in with his environment.

The earliest recorded contact with European peoples occurred in 1609. These early travellers confirm that the natural world bountifully met the needs of all the peoples. The territory was shared with vast amounts of deer, elk, moose, beaver, and rabbits and forests of ample bear. The people also raised large crops of diverse domesticated plants. The culture of these peoples developed many characteristics Europeans associate with religion. However, for the people of the Longhouse, there was no word for religion – the spiritual was the way of life. To be a Mohawk meant following a way shared by other people of the Longhouse, in which the natural world was seen as a gift from the creator of life.

The culture developed around a philosophy of a lifetime of thanksgiving to the Creator for all the things human beings need to be spiritually healthy

and strong. Long ago, the Mohawks were the first of the five North American nations to accept and develop a form of government based upon the principle that governments have as their primary function the responsibility to halt abuse of human beings by other human beings. It was based upon principles of promoting peace among peoples, and peace in most cases was determined by negotiation. Belief in the freedom and dignity of the individual was deeply engrained in the members of the Iroquois Confederacy. The tribal councils decided on courses of action by unanimous rather than majority agreement. The feelings and opinions of each person were considered too important to override. These beliefs left their mark on the sixteenth and seventeenth century philosophers, whose writing ignited the revolutions which eventually changed the world. The idealistic conceptions and political structure contained elements of democracy and representative government that influenced the founding fathers of the American colonies as well as the United States Constitution. The historian Horatio Hale wrote: "Instead of a race of rude and ferocious warriors, we find a kindly and affectionate people, full of sympathy for their friends in distress, considerate of their women, tender to their children and anxious for peace." The Mohawks, the Eastern Doorkeepers, had the greatest contact with the European colonizers and suffered the most from this contact.

The natural accompaniments to the wars of self-preservation were the development of characteristics of ferocity, craft, and cruelty, which no more indicated the Indian's true character than did the warpaint, plume and tomahawk. History can show no parallel to the heroism and fortitude of the American Indian in the two hundred years' fight during which he contested inch by inch the possession of his country by a foe infinitely better equipped with inexhaustible resources and in overwhelming numbers. Courage was the virtue chiefly honoured by the North American Indian. His whole life and training concentrated on making him calm, fearless, and efficient in every possible situation. The Indian evolved into a balanced blend of hunter, naturalist, and conservationist – a man with many polished outdoor skills and abilities, whose affection and knowledge of nature were matched by his efforts to conserve it. James Fenimore Cooper called the Indian, "the ideal man in the state of nature." However, this kind of man was not equipped to resist the arrogance and mindless disregard of nature possessed by the technological man.

In 1855, Chief Seathl wrote a letter to the President of the United States. He had never heard of the words conservation or ecology but made the most haunting and eloquent plea for them. I would like to read this letter to you.

"The Great Chief in Washington sends word that he wishes to buy our land. The Great Chief also sends us words of friendship and goodwill. This is kind of him, since we know he has little need of our friendship in return.

"But we will consider your offer, for we know if we do not do so, the white man may come with guns and take our land. What Chief Seathl says, the Great Chief in Washington can count on as truly as our white brother can count on the return of the season. My words are like the stars – they do not set.

"How can you buy or sell the sky – the warmth of the land? The idea is strange to us. We do not own the freshness of the air or the sparkle of the water. How can you buy them from us? We will decide in our time. Every part of this earth is sacred to my people. Every shining pine needle, every sandy shore, every mist in the dark woods, every clearing and humming insect is holy in the memory and experience of my people.

"We know that the white man does not understand our ways. One portion of the land is the same to him as the next, for he is a stranger who comes in the night and takes from the land whatever he needs. The earth is not his brother, but his enemy, and when he has conquered it, he moves on. He leaves his father's grave behind and does not care. He kidnaps the earth from his children. He does not care.

"Our children have seen their fathers humbled in defeat. Our warriors have felt shame. And after defeat, they turn their days in idleness and contaminate their bodies with sweet food and strong drink. It matters little where we pass the rest of our days – they are not many.

"A few more hours, a few more winters, and none of the children of the great tribes that once lived on the earth, or that roamed in small bands in the woods, will be left to mourn the graves of a people once as powerful and hopeful as yours.

"One thing we know which the white man may one day discover. Our God is the same God. You may think now that you own our land. But you cannot. He is the God of man. And His compassion is equal for the red man and the white. The earth is precious to Him. And to harm the earth is to heap contempt on its creator.

"The whites, too, shall pass – perhaps sooner than other tribes. Continue to contaminate your bed, and you will one night suffocate in your own waste. When the buffaloes are all slaughtered, the wild horses all tamed, the secret corners of the forest heavy with the scent of many men and the view of the ripe hills blotted by talking wives, where is the thicket? Gone. Where is the eagle? Gone. And what is it to say goodbye to the swift and the hunt, (it is) the end of living and the beginning of survival.

"We might understand if we knew what it was that the white man dreams, what hopes he describes to his children on long winter nights, what visions he burns into their minds, so that they will wish for tomorrow. But we are savages. The white man's dreams are hidden from us. And because they are hidden, we will go our own way. If we agree, it will be to secure the reservation you have promised. There perhaps we may live out our brief days as we wish.

"When the last red man has vanished from the earth, and the memory is only the shadow of a cloud moving across the prairie, these shores and forest will still hold the spirits of my people, for they love this earth as the newborn loves its mother's heartbeat. If we sell you our land, love it as we've loved it. Care for it, as we've cared for it. And with all your strength, with all your might, and with all your heart preserve it for your children, and love it as God loves us all. One thing we know – our God is the same God. This earth is

precious to him. Even the white man cannot be exempt from the common destiny.

“His father’s grave and his children’s birthright are forgotten. His appetite will devour the earth and leave behind only a desert. The sight of your cities pains the eyes of the red man. But perhaps it is because the red man is a savage and does not understand . . .

“There is no quiet place in the white man’s cities. No place to hear the leaves of spring or the rustle of insects’ wings. But perhaps because I am a savage and do not understand – the clatter only seems to insult the ears. And what is there to life if a man cannot hear the lovely cry of a whippoorwill or the arguments of the frogs around a pond at night? The Indian prefers the soft sound of the wind darting over the face of the pond, and the smell of the wind itself cleansed by a midday rain, or scented with a pinion pine. The air is precious to the red man. For all things share the same breath – the beasts, the trees, the man. The white man does not seem to notice the air he breathes. Like a man dying many days, he is numb to the stench.

“If I decide to accept, I will make one condition. The white man must treat the beasts of this land as his brothers. I am a savage and I do not understand any other way. I have seen a thousand rotting buffaloes on the prairies, left by the white man who shot them from a passing train. I am a savage and I do not understand how the smoking iron horse can be more important than the buffalo that we kill only to stay alive. What is man without the beasts? If all the beasts were gone, man would die from great loneliness of spirit, for whatever happens to the beast also happens to the man. All things are connected. Whatever befalls the earth befalls the sons of the earth.”

The destruction of the North American Indian society is partially due to the red man’s resistance to change. Change is something that occurs inside people. When they become dissatisfied with that which they have and try to rid themselves of it or they find a desirable new philosophy to add to that which they already possess. Why has the North American Indian resisted change even at the price of his own destruction? It appears that most Indians will not make a change which requires them to switch identification, if a change requires them to desert their group and their group symbols. Nor will they violate their established moral values. If in order to get along in this world, he is required to give up or defile that which is most sacred to his people, most North American Indians will refuse to do it.

The history of the United States and Canada in the past century is the most violent and most destructive in the history of civilization with regard to the use of forests, grasslands, wildlife and water resources. Not only have the larger forms of wildlife been virtually reduced to the vanishing point, but non-game birds, as well as many of the small mammals, are hunted for the pure joy of killing.

Industrial pollution also does much to aid in animal extermination. The North American Indian did not kill his animal brothers for sport. All life was sacred to him and he knew that he was only one small part of the life on this earth. If he was hungry he killed to eat and then thanked the spirit of the animal and also the Great Spirit who sent the animal to appease his hunger.

The Indian killed only to supply his own needs and wasted nothing. He never boasted of his ability to kill. It was thought that only cowards lacked consideration for the life and feeling of all the other creatures of the earth.

Our fathers spoke to the animal they killed thus: "I am sorry that I had to kill you, little brother, but I had need of your meat. My children were hungry and crying for food. Forgive me, little brother, I honour your courage, your strength and your beauty. Each time I pass this place I will remember you and your spirit."

The belief in the unity of all living things is deeply rooted in the Indian psyche, and the manifestation of the Great Spirit figured in all aspects of the life of my people.

Canada is a vast land. It is a land rich in natural and human resources. Unlike its neighbours, much of its natural wealth is still intact. The great push to exploit the natural resources in northern Canada has gained tremendous momentum in the past few years. Industry and government have joined together in the race for minerals, natural gas and oil: a partnership which has all the marks of a well known "Canadian-style development - private enterprise at public risk". For years, the forest industry has been cutting more trees than can easily be grown back.

The Indian has been a conservationist for thousands of years. He knows that large scale resource extraction will disturb everything in our natural environment. When the trees are gone, when the rivers are dammed and when the pipelines are built the animals and fish will disappear. This loss is the beginning of destruction of man as well. Today's conservation movement must turn back to the ancient North American Indian ideas concerning the land and mankind's relation to nature.

North American Indian life is a partnership with nature; it is seen as the renewable resource whose benefactions will continue if one does not abuse or exploit it. From this wisdom perhaps will come the knowledge needed to conserve the best parts of our continents. In the recent decades the world has come slowly back to the truths that the North American Indians have known from the beginning:

Unborn generations have a claim on the land which is equal to our own; men need to learn from nature; they need to keep their ears tuned to the earth and to replenish their spirits in frequent contact with the wilderness. The most important need of all is for man to recover a sense of reverence for the land, for beneath it all is the land.

Wilderness Leadership School

IAN PLAYER

To speak about the Wilderness Leadership School I have to speak about myself and the influences that shaped my thinking towards its creation. As a child in the highveld of the Transvaal I was aware of the rhythm of the veld and I can clearly remember the feeling of tremendous excitement, waking up long before dawn on the edge of the Kruger National Park and hearing lions growling and snarling in the reeds along the Sabie River. I was aware of a power which I could not describe but which was always within me, waiting for expression.

After the 1939-1945 war I returned to Natal where my great-grandfather from the United Kingdom and my great-grandmother from Graaff-Reinet had settled and where members of my family served the old Natal colonial government, in the civil service and in the army.

In 1950 I pioneered a canoe trail from Pietermaritzburg, the capital of Natal, to the seaport of Durban, a distance of some 200 kilometres. I was for most of the way alone in comparatively wild country and it was on this trip that I realized the value of the environment of solitude and the need for modern man to have a period away from the crowd. I was constantly aware of the forces of nature: a storm in a deep valley, lightning flashing on ironstone and thunder reverberating round the hills, made me ponder my own significance. The burning heat of midday was a reminder of the power of solar energy which maintains life on our planet while the thirst it created was a lesson in our dependence upon water.

This canoeing experience changed my life. The whole environment took on a new meaning and gave me an understanding of wilderness in the religious and conservation sense. I would not, however, have been able to describe or verbalize what wilderness was. It was just an understanding.

In 1952 I joined the Natal Parks Board as a relief ranger, working in various game reserves relieving rangers who were on leave or ill. Within two years I had worked in nearly all the major game reserves of Zululand including the isolated Ndumu Game Reserve on the Mocambique border. For human company I had Zulu game guards whom I came to respect and admire for their vast knowledge of nature and wonderful attitude to life. In 1955 I was sent to the Umfolozi Game Reserve to take charge of anti-poaching measures to control the gangs of white and black poachers which were infiltrating the reserve.

It was here that I met Jim Feely and on our long foot patrols along the banks of the White and the Black Umfolozi rivers and into the far western crown lands we discussed conservation from morning until late into the night. We had to fight off poaching gangs, burn firebreaks, build game guard

camps and plan for the future. We were poorly paid, inadequately housed but full of fire, faith and enthusiasm and led by a great director, Colonel Jack Vincent. Living in wild country was what we wanted to do and our morale was high.

Jim Feely was well read in American conservation literature and introduced me to Aldo Leopold, the father of game management. Jim also told me about the American Wilderness Society and one day which I shall never forget, he handed me a piece of paper listing the ten fundamental principles of the wilderness concept. As I read, it was as though an atomic bomb had gone off in my mind. I realized that I had always understood physical wilderness but had never appreciated the intellectual concept. It was something I had known and understood and inwardly felt since I was a child on that early morning in the Kruger National Park and here it was verbalized.

My immediate reaction was to press for a wilderness area in the Umfolozi Game Reserve and what would be a good time to do it, because the reserve had not been properly planned or opened to the public. There was considerable official opposition. Some members of the board did not understand the concept and were antagonistic towards it because they thought it would deny them access to some of the remoter areas of the game reserve. However, at that time I was corresponding with Howard Zahniser, the then secretary of the Wilderness Society, and he kept me up to date with all the current literature, including that most valuable document, S. 1176, the National Wilderness Preservation Act hearings. It was in here that I found every argument for and against wilderness and the torn cover and well thumbed pages as well as the annotations and underlinings testify to its enormous value and perhaps to the number of times I had to use it to defend my proposition. An administrative battle persisted in one way or another for the next three years but finally it was decided that the southern part of the Umfolozi Game Reserve would be designated a wilderness area. There was no other wilderness area in South Africa.

In 1957 I was sent to Lake St Lucia to establish a ranger's post near Charters Creek. I began at once to ensure that a wilderness area would be set aside on the lake and it was here in July 1957 that six schoolboys from my old school, St Johns College, spent a week with me. I took them in the course of my patrols to the bird breeding islands where white pelican, Caspian tern, grey-headed gulls and other species came to breed. It was the time of year when mullet come in from the sea and go up the lake in vast numbers. I took the boys to the eastern shores which lie between the lake and the Indian Ocean, where there are indentations and small streams full of hippo and crocodile. I also sent them walking down the coastline which was uninhabited and full of strange and interesting sights such as the sandstone caves where thousands of bats roost in the dark recesses.

The experience made a profound impression on these young men and when they returned to their homes they wrote to me and each boy said, "This experience changed my life," a phrase that has become a refrain from participants in the Wilderness Leadership School trails.

It made me think of my past five years' experience as a wildlife conserva-

tion officer and the difficulties I had encountered when talking to magistrates, policemen, farmers and politicians. Our worlds were so different that I could have been talking to people from Mars, there was so little understanding. The future did not look rosy. All the game reserves were threatened in some way or another and every day there was a difficulty in implementing the wildlife ordinances, as well as this gap in communication.

These young men made me realize that the future lay in their hands and in the hands of others like them and that if the concept of wildlife conservation and the retention of wildlife sanctuaries was to succeed, it would be necessary to have an informed public particularly of people in leadership positions. Slowly the idea of creating an organization which would make it possible for more people to experience what these young men had experienced, was born. I realized in thinking back over the past five years that my whole attitude to life had improved because of the experiences I had had in wild country, so I resolved to start an organization which I would call the Wilderness Leadership School.

In 1958 I returned to Umfolozi Game Reserve as the senior ranger in charge with instructions from Colonel Vincent to plan the reserve. My idea was simple: half the reserve would be for tourists in motor vehicles and the other half would be a wilderness area. This took time to implement because officialdom never takes kindly to what it considers to be radical ideas. But we persisted and in the end good sense won the day.

By 1959 I had instituted walking trails of not more than six people for the Natal Parks Board, and personally took almost a trail a fortnight for a whole year. It was obvious that the experience made an impact and the number of trails increased. Extra staff was employed and the idea caught fire, but deep down I knew there was something missing. It was difficult to define but could perhaps be described as a blasé attitude amongst many of the people who went on trail. The Board could not pick and choose who it wished to take out on trail. Whoever could afford to pay had the opportunity. I felt strongly that there were many leaders who were not for various reasons being given the chance to participate. So I became more determined than ever to press on with my idea of the Wilderness Leadership School and to turn it into a movement which would be of real conservation significance so that it would not only give the wilderness experience but would also eventually provide a conservation political base for those who had been out on trail.

In those days we had neither property nor money nor equipment. But we had an idea and I also had some excellent friends like Hugh Dent, the trails officer, and I would say to him, "There are six boys coming. I want you to make this a Wilderness Leadership School trail. Take them on a longer walk, make them go without water, make them listen to the wild sounds in the night and make them realize that the key to the future of all wild areas in Southern Africa lies in their hands."

Within a few years we had some financial support. My brother, Gary Player, donated the winnings of a tournament and the Round Table organization established a special fund to assist us. In 1963 the school was formally

registered as a trust with a list of people who were prominent in Natal, as trustees. In 1964 Carl Erasmus, a Durban businessman, took over the job of chairman and made a very important contribution to the growth of the school.

I had recently become chief conservator of Zululand and had been invited to America by Metro-Goldwyn-Meyer, following help I gave as technical adviser to a film they made in the Umfolozi Game Reserve. My first American journey gave me the opportunity to talk about the school and make worthwhile friends for the idea. Within a year or two the school was able to employ its first full-time officer and by 1966 it had become a recognized institution. We were now concentrating on the multipliers: journalists, radio personalities, doctors, lawyers, architects, teachers, anyone who was in a position to influence others. The school had grown from an organization that took out schoolboys to something far more influential.

In 1967 Barry Clements, who had served with me on the Natal Parks Board, joined the school and eventually became its first director. In 1969 I was invited to address the Game Conservation International conference at San Antonio, Texas. The president of that organization, Harry L. Tennison, gave immediate support to the idea of young Americans going out on trail and it was from Texas that we had our first recruits. Other American hunter-conservation organizations such as the Mzuri Safari Foundation became involved and men like Dick Davis donated most generously to our cause. The Americans, with their firm belief in good ideas, became the Wilderness Leadership School's strongest ally. I would like to record my deep debt of gratitude for their invaluable support over the long and many hard years of our existence.

In 1970 Anglia Television made the first television documentary on the school. This was followed in 1973 by an hour long documentary screened by NBC and which enthralled people all over the world. I continued to visit America on my leave, to raise money and address audiences, and I appeared on radio and television programmes.

In 1974, after serving with the Natal Parks Board for 22 years, I resigned my position and went to work full-time with the International Wilderness Leadership Foundation which had been formed in the United States with an impressive board of people such as Dan Galbreath, Ed Gott, Tim Timken, Harry Tennison, John Olin, Gary Player, Arnold Palmer and Bob Cleaves, as well as others. A contract was signed with the Explorer Division of the Boy Scouts of America and now over fifty young explorers have been on trail with the Wilderness Leadership School in Zululand and the Transvaal.

The Wilderness Leadership School has also operated a trail in Rhodesia, Mocambique and Botswana. It was one of the first organizations to include all the races of South Africa and to conduct completely multiracial trails. This was neither easy nor popular in many circles but we persisted.

The symbol of the Wilderness Leadership School since its inception has been the *Erythrina caffra* leaf. Each of its three points represents a part of the philosophy of the school: man to God, man to man, and man to soil, in our opinion three of the most important relationships for mankind.

In 1976 a Wilderness Leadership Foundation was established in the United Kingdom with Laurens van der Post, Edmund de Rothschild and Katherine Littman playing leading parts. Plans are being formulated to establish a foundation in Western Germany.

From an idea in 1957 the school has become an international movement and has contributed to the conservation cause. Over 3500 young and old leaders from all walks of life have been out on trail on a journey of self discovery. Their contribution to conservation and wilderness makes itself felt almost every day, not only in South Africa but in other countries too.

Future plans for the school are in keeping with the original concept, "to make the maximum impact with the minimum resources." Our dreams are not of vast but effective numbers of conscientious people determined to lend their weight to the maintenance of wild areas on our planet, so that they can be handed over unimpaired to the next generation.

We have no illusions of either the importance of the magnitude of our future tasks and we appreciate that all our efforts are only a contribution to conservation. But we do strongly believe that it is an important if not vital contribution and that other schools similar to the Wilderness Leadership School will be established in other parts of the world.

We know that we cannot make ecologists of all the young people who go on trail, but we also know that what begins as an African adventure becomes an emotional experience and a religious quest. The men who take people into the wilderness are good men, good in the almost forgotten Biblical sense of the word. Parents can trust their children to be taken into the wilderness by such men to learn the lessons this unique school has to teach.

With boys, girls and adults coming from the United States and other countries, it is within the power of the International Wilderness Leadership Foundation to make of this exchange a movement that will benefit all mankind. The trails have become a meeting place of minds, where around the campfire at night, experienced field officers guide the talk to the three basic questions: Who am I? What am I? Where am I going? The setting is the unique, magical continent of Africa, and at night when the skies sparkle with stars there is time to reflect on the life drama of veld and bush: creation-birth-growth-maturity-decay-death-rebirth.

As Chairman of the first World Wilderness Congress, held in Johannesburg in October 1977, I wish to express my deep thanks to the following people who, unable to attend the congress, contributed generously and made it possible for the less privileged in South Africa to attend in their stead.

Mrs Malcolm G. Dickinson, U.S.A.

Donald E. de Kieffer, U.S.A.

Gaylord Donnelly, U.S.A.

Alvin S. Moody, U.S.A.

Mr and Mrs Norman Pearson, Canada.

Frank H. Wesson, U.S.A.

The Maintenance of Wilderness Diversity in Africa

K.L. TINLEY

A Humane Approach

Why care for people? Because people are the primary and ultimate source of any wealth whatsoever. If they are left out, if they are pushed around by self-styled experts and high-handed planners, then nothing can ever yield real fruit.

E.F. Schumacher 1973

The present and future survival of wildlife and natural areas in Africa depends almost exclusively on the favour of the rural human populations in everyday contact with them. All conservation measures will be fruitless until these populations are made to realize the value of these areas by obtaining immediate tangible benefit from them, and until they are involved in their protection and use as part of the regional economy in the widest sense. Simultaneously there must be change in traditional practices towards intensive land use and in practical education to promote sound husbandry of habitats. These factors are basic in changing the deteriorating conservation trend on the continent.

There are approximately 260 million people in Africa south of the Sahara of whom ninety per cent are rural, that is, directly dependent on ecosystems for their life requirements. Africa has the largest spectrum of wild ungulates in the world. They have evolved highly successfully with the full diversity of biomes on the continent – from extreme desert to rain forest – and are adapted to many of the diseases lethal to domestic stock such as *trypanosomiasis* (nagana) transmitted by tsetse flies.

There are altogether ninety-one species of wild ungulates in Africa compared to only twenty in South America for example (determined from Dorst and Dandelot of 1970, and Keast 1972, Ch. 8). This unique assemblage of herbivores was, and still is in parts, the protein basis of the peoples of Africa, with the exception of certain groups such as the Maasai pastoralists. But decimation over vast areas in the name of development, tsetse control and unbridled hunting has reduced this resource, the remnants of which are protected today in national parks. But in many parks these wildlife populations are now threatened by their own overpopulation as a result of the effect of sanctuaries, and by the damage that such overpopulation does to their habitats.

Yet more than ninety per cent of Africa suffers from a deficiency of protein and calories! The African paradox – dying amidst plenty, or what should be an infinite food resource if used on a sustained yield basis. About fifty-six per cent of the continent is arid (including desert, sub-desert and arid savanna), thirty-five per cent is moist but infested with tsetse fly and *trypanosomi-*

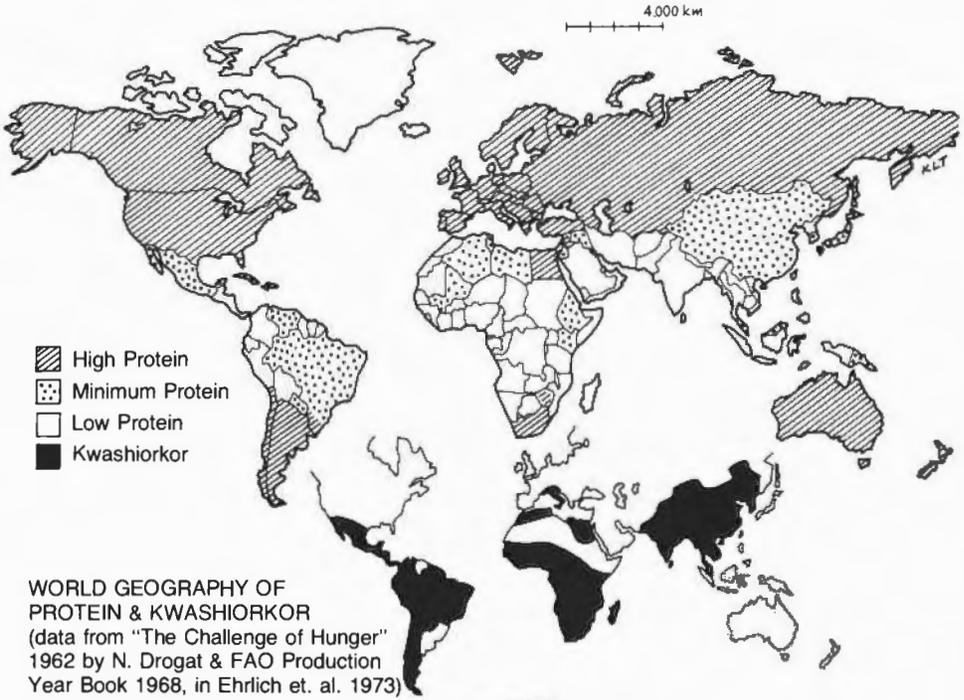
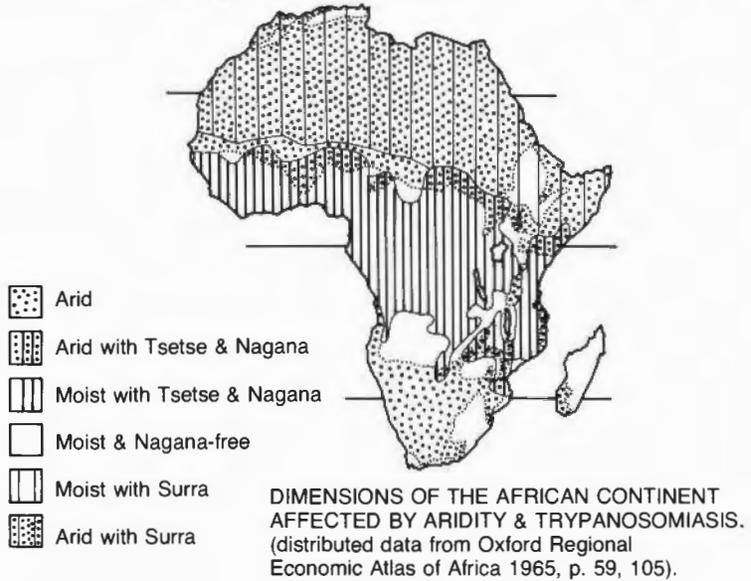


Fig. 1



asis (three per cent of this includes Ethiopia and the Marghreb where tsetse fly is absent, but where the *Surra trypanosome* which affects domestic stock is transmitted mechanically by horse-flies), eight per cent is moist and free of tsetse – a ratio of 5:3:1.

In the savannas, grasslands and deserts of the Sahel, East Africa and southern Africa, there are between seventeen and eighteen species of gregarious ungulates which are potential sources of protein, and about eleven

species in the Horn of Africa (Table 1). The forests and thickets have their own wide variety of diminutive ungulates which occur typically in small groups or pairs.

Fraser Darling (1960) has given the most lucid exposition of the potential of the indigenous African ungulates as a bountiful resource. He makes the point (p. 133) that the need for cropping overpopulations of ungulates in most national parks and the example of efficient utilization of the meat in some "exposes the inadequacy of the notion that national parks should be absolute sanctuaries." Ledger (1964) Talbot *et al* (1965) and Laws *et al* (1975) amongst others corroborate this thesis.

TABLE 1

Possible protein producers in Africa: Indigenous gregarious ungulates easily harvested

SAHEL & SUDAN	EAST AFRICA	HORN OF AFRICA	SOUTHERN AFRICA
Elephant	Elephant	Elephant	Elephant
Hippo	Grevy's Zebra	Grevy's Zebra	Plains Zebra
Warthog	Plains Zebra	Hippo	Mountain Zebra
Giraffe	Hippo	Giraffe	Hippo
Giant Eland	Warthog	Beisa Oryx	Warthog
Addax	Giraffe	Hartebeest	Giraffe
Scimitar-horned Oryx	Eland	Pelzelns Gazelle	Eland
Defassa Waterbuck	Beisa Oryx	Soemmerings Gazelle	Gemsbok
Kob	Defassa Waterbuck	Gerenuk?	Common Waterbuck
Nile Lechwe	Common Waterbuck	Dibatag?	Lechwe
Bubal Hartebeest	Kob	Buffalo?	Red Hartebeest
Topi	Hartebeest		Miombo Hartebeest*
Dama Gazelle	Topi		Blesbok
Dorcas Gazelle	Blue Wildebeest		Black Wildebeest
Red-fronted Gazelle	Impala		Blue Wildebeest
Buffalo	Grant's Gazelle		Impala
	Thomson's Gazelle		Springbok
	Buffalo		Buffalo
16	18	11	18

In the forest and thicket biome there are 26 species of small ungulates, and locally other species not listed may be sufficiently abundant to provide a sustained yield.

*Miombo hartebeest = Lichtenstein's hartebeest.

Education and Policy: Iniquity of the Industrial Approach to Life and Land Use

Education is very firmly based on the old thinking system . . . while we have made great progress in every other field it is considered to be a matter of great pride that over more than two thousand years we have made no progress at all in developing new thinking tools.

Edward de Bono 1973

All western education remains subservient to industrial and economic values. The continued dominance of these values as the determinants of life is a

major culprit in the alienation of people from the land and the destruction of human communities and their habitats (Reich 1970, De Bono 1973, Schumacher 1973, Toffler 1975). Until human and environmental values become the determinants of life through the education process, dissension and unbridled damage to the environment will increase. Because of wrong emphasis in education, rural people are made unfit for rural life and are inexorably driven to the city to attain those material values expounded by the education process. But once there, they are frustrated by the inadequate standard of education that they have attained and by lack of opportunities in an already congested urban job market. What they have totally missed due to wrong education is that the greatest opportunities for work are in the human services in their own rural areas, which must become self-sufficient in producing food for survival. The education they receive at present in the rural areas is totally unrelated to fulfilment of the rural way of life. Unsuitable education is a major culprit in driving people off the land. Schumacher (1973), an economist, states: "In our time, the main danger to the soil, and therewith not only to agriculture but to civilization as a whole, stems from the townsman's determination to apply to agriculture the principles of industry."

Two key factors have been responsible for the evolution of the essential human characteristics of man. One was the far greater than average contribution to the genetic composition of future generations by leaders of polygamous groups. Attributes such as foresight, inventiveness, leadership, co-operation and understanding would be favoured by natural selection through the tremendous reproductive advantage of a leader in a self-contained group (Mayr 1963). This factor still applies in many parts of rural Africa, but the efficacy of such favourable selection is immediately reduced as more and more people move to the towns enlarging and thus diluting the unit of evolution, and compounding it by a monogamous lifestyle.

The other biological feature responsible for the acceleration of human evolution is parental care (Mayr 1963). This permits extended mental conditioning of the young to the peculiarities of his particular culture and habitat. Later education and training, now the responsibility of formal schooling and university, continues the conditioning process. De Bono (1973) shows that the industrial or old thinking system which has not changed since Grecian times is dedicated to defending established ideas based on the logic of fixed concepts, certainties and absolutes. Ideas in such a rigid thinking system can be changed only by total confrontation and the triumph of one idea, but leaving neither changed. It is for these reasons that any new idea, in bureaucratic circles especially, is looked upon as a threat to civilization – perhaps as this is equated with industrialization.

The industrial approach (De Bono 1973, Toffler 1975) provides the same monocultural education for everybody overlooking the inherent injustice and anti-democratic denial of equal opportunity. Differently endowed groups (or individuals) obtain a different quantity and quality of education from the same course; thus only by making allowance for each can true democratic equality in education be achieved (Mayr 1963). As university disciplines in South Africa remain largely confined to their own departments, it

is not possible to obtain, for example, a holistic course in ecology except by organizing one's own curriculum. This lack of interdisciplinary training promotes the continued handling of human and environmental issues in isolation and leads to decisions being made by specialists in other fields. Cases in point are engineering firms advertising as environmental planners, and the increasing barrier of inertia of centralised bureaucratic systems, resulting in decreasingly effective treatment of these issues.

Initiative-crushing, uniform, industrial and regimented thinking has also deeply affected the departments responsible for conservation of wildlife and natural areas in Africa (Tinley 1971). All parks had to have the same policies, the execution of which placed total reliance on restrictions, despite their different physical and cultural settings. Total isolation was achieved firstly by parks being fenced off either physically or by means of efficient control over poaching; secondly, by not contributing to the local regional economy, since any income "disappears" into central government coffers. Carcasses produced from culling overpopulations of ungulates were destroyed or left to rot to "improve" the nutritional status of the habitat, imitating the destruction of thousands of tons of food in agriculture because it is more economic to do so!

Probably the worst examples on this continent of rigid preservationist conservation was the destruction of unique hunter-gatherer tribes by over-efficient control, the Ik of the Kidepo Park in Uganda (Turnbull 1973) and the Liangulu in Tsavo (Holman 1967). In the latter park area the Liangulu are specialists in elephant hunting with the bow and were exploited by dealers to poach ivory on a large scale. It is ironic that since they were put down, explosive increase in the elephant population occurred, resulting in large-scale devastation of the habitats and a massive die-off of over 6 000 elephant – not one kilo of which was used as food. This year another massive die-off has occurred. Had the authorities at the beginning merely modified the approach of the Liangulu to culling for meat production as well as for ivory on a sustained yield basis, a protein resource of large proportion could have been maintained to the great advantage of the habitats, animals and man. It seems that the Central Kalahari Game Reserve in Botswana remains the only one of its kind where hunter-gatherers are part of the park ecosystem.

Most conservation departments have based their activities on the dogma that tourism and wildlife conservation are the two sides of the same coin. Thus staff and funds are used mostly for catering and tourist facilities and the natural areas become filled with urban nuclei to justify the existence of parks. In this way conservation departments continue to be directly responsible for despoiling the last wild places for which they are the custodians. Tourism is a spin-off; one only needs experience of political unrest and terrorism to be jolted into the realization that there are more fundamental reasons for protecting viable examples of natural areas.

A perfect example of the industrial approach to land use is the irresponsible and indefensible public statement made in April 1976 by FAO experts on the tsetse fly problem (see Goldsmith 1976: 198-199). They declared that a massive but long and difficult campaign to eradicate the tsetse fly in Africa

could double the total number of cattle on the continent and thus open up "one of the world's greatest potential untapped sources of protein food." Compare Fraser Darling's perceptive exposition in 1960 of the same subject of protein resources in Africa, based on the human and environmental characteristics of the continent. The former approach typifies industrial or old thinking (De Bono 1973) as the only people who would gain from such an environmental onslaught would be the vested interests of the chemical industries of the West.

The evils incurred by introducing large-scale cash crops such as cotton into African shifting cultivation cultures is little appreciated. In one land-using period as much land is required as would have been used in fifteen or twenty years for the food of one family (using one hectare to a family over a three year period, before exhaustion of the soil requires new land to be cleared). The bank of virgin land allowing a sufficient period of fallow is thus swallowed up in two to three seasons.

In this way land "hunger" is engendered under low human population densities where cash crops are grown for sale to industrial countries instead of growing food. It does not require much imagination to realize the impact this has on already circumscribed ecosystems such as montane, riverine and dune forests. In the face of such pressure, conservation of natural areas must take second place owing to our ignorance of the real factors, allowing agriculturalists or politicians to apply the moral excuse that man comes first.

It is iniquitous, too, that industry is being decentralized and established in rural areas under the guise of raising the standard of living of "poor" rural people who are in fact far better off than their urban counterparts. Industry degrades human communities and their habitats everywhere by exploitation and dehumanisation. Industry should remain where it is already established, in the cities, otherwise it will spread like a blight causing tremendous human and environmental devastation, which "industrial thinking" will assume can be rectified by further technological innovation (Tinley 1974). Goldsmith (1976: 203-204) sums up perfectly where the advantages really lie . . . "It is (for the industrial world) a means of obtaining food and other essential commodities and at the same time it creates a market for the manufactured rubbish to whose production it has become committed . . ."

All these invasions of natural areas under false premises such as land "hunger" or raising the "quality" of life in rural areas are imposed by the application of material determinants in the planning and development of human communities and their habitats. Natural areas will shrink further or be lost because conservation organizations lack sufficiently wide expertise to question and evaluate the needs and pressures raised as reasons for exploitation of further natural areas (Table 2). More intensive use of areas already partially developed would absorb extra people far more effectively.

The Place of Natural Areas in the Regional Economy

Although scientists appreciate and are anxious to preserve the magnificent collection of Pleistocene mammals so well preserved in Africa . . . these admirable

sentiments cannot be expected to weigh much with a people fighting for their very existence.

T.R. Odhiambo 1963

National parks, forest and nature reserves are areas set aside for the protection of unique ecosystems or system components from damage by human ignorance or greed. Such areas are protected for their own intrinsic worth as living integrated systems of landscapes, as well as for numerous human benefits. Added to these are strictly protected areas (eg. for endemics), wilderness areas, water catchment reserves and hunting areas of various kinds, which together are referred to here as natural areas – landscapes of indigenous fauna and flora and including primitive hunter-gatherer men and pastoralists.

In rural areas a diversity of ecosystems in a region means an increased array of choice for animals and man under changing environmental conditions, as many kinds of systems each have different potentials and responses to changes in the environment. Such natural areas protect in available form many types of information and resources (for example plant and animal protein) for direct or future use, either to increase the productivity of the adjacent human habitats, or as living laboratories for research on the dynamics of natural systems (Tinley 1971). These dynamics include geomorphic and biotic succession, interdependence and co-relations. This information is fundamental for distinguishing natural changes in the environment from those induced by man. Protected natural areas are thus a standard base against which all changes in the surrounding human habitat can be measured. The most important changes are those affecting productivity of soils, for which drought and poor land husbandry are commonly held responsible.

Apart from their scientific and economic importance, natural areas are of inestimable cultural and educational value. They are vital too as natural sites where urban man can be exposed to wilderness experience – a specialised recreational use. In sum, natural areas protect the diversity and dynamism of man's environment for his survival, enhancement and joy in the social, physical and biological senses.

Under an ever increasing explosion of human numbers and hunger problems, such unique natural areas require complete protection from damage by human activities. But at the same time they are finite islands in a much larger landscape which is undergoing natural and cultural change all the time. Surface changes are due primarily to geomorphological processes of cut (erosion) and fill (deposition), resulting in widespread or local changes in soil moisture balance. This alone can be the fundamental factor determining where forest, savannas, grasslands or vleis occur. Superimposed on this are secondary or accelerator factors influencing soil moisture balance such as excessive fire, or misuse of the land by man and his stock.

Thus, natural areas require not only internal management to ensure survival of those features for which they were protected, but also require to be seen in the regional context. This context must be geomorphic, ecological and economic. By economic is meant not only the narrow monetary benefits,

but the full range of natural resource values to the surrounding human communities. Economy is the judicious use of the resources of a community for which management, regulation and authority is required for its maintenance and distribution. Many rural communities in Africa have their own socio-religious controls for a sustained land husbandry (Allan 1965, Lee and De Vore 1968, Omo-Fadaka 1976). An idea of the multiplicity of products from natural areas important to rural economies is shown by the following list: animal foods, drought foods, honey, wax, timber, thatch, firewood, twine, fruit, seeds, medicines, oils, dyes, gums and resins, spices, spinages, tuber foods, tannins, weaving materials, scents, hunting materials, including poisons, shellfish from tidal rocks on coasts and the products of freshwater systems, including water itself, and the social values of hunting and gathering.

Today most bush-lore remains stored away in the minds of the old and is tragically lost with their passing, since it is not passed on to their industrially-educated young. A concerted effort must be made to record this knowledge before it is too late, and have it incorporated into rural education, to encourage appreciation of the value of many of the cultures and traditions. A similar problem exists all over the world where unique man-land relationships are destroyed by industrial impact. For example amongst Australian Aborigines of Cape York peninsula famine is unknown in the older generation which has a varied and nutritious diet derived from hunting and gathering; and yet their children are being made unfit for such a life by industrial-type schooling and are increasingly dependent on imported foods (Harris 1976).

Over large parts of Africa national parks, forest reserves and other specially protected sites were given total preservation status without thought of the consequences. Such a status was necessary in the initial stage to ensure that they were not encroached on by human activities. But after this critical point had been overcome, there was no reassessment of the resources specially protected in the light of the natural processes in the landscape. Many of these resources protected for their unique features are now threatened internally by natural processes of succession, such as invasion of floodplains by savanna, and lechwe replaced by impala.

In the larger national parks efficient protection has resulted in population explosions of the larger herbivores, with attendant damage to the habitats. Culling programmes have been initiated in some to balance the herbivores with the pasture resource. The products of these culling programmes, typically, never benefit the surrounding human populations. Either private enterprise or the central government are the sole receivers of any financial advantage from such programmes. The same consequences result from tourism at national parks and reserves. In this way natural areas have existed as islands up to the present, not contributing directly to the regional economy.

The dimension of influence of any economic advantage to the surrounding human populations depends on the size of the natural area and its turnover of products. A large national park with alluvial grasslands capable of producing more than 500 tonnes of meat a year from wildlife will have a far greater sphere of influence than a small natural area, especially if the latter is

capable of providing only forest products. But the two resources are incomparable, because they are quite different. The sphere of influence of small natural areas would be far greater if there were many of them. The outcome of any possible future increase in wildland thus rests on the success of the present natural areas in taking part in the regional economy.

Only by involving the surrounding human populations in the responsibility of conserving the natural areas as part of their regional resource will it be possible to ensure survival of such areas beyond legislation and changes in policy of a central government. The monetary income obtained from park or natural area usage should ideally be used solely for the educational, medical or agricultural benefit of surrounding human communities, as well as providing means for maintaining the natural area.

Over the past five years an extremely successful red meat production scheme, coupled with hunting, was initiated and built up by my brother, Charles Tinley, on Bester's Game Ranch of 6 000 hectares in the Zululand thornveld. In the first year, 1972, 100 animals were culled for hunting only, fetching R7 500. In the second year 350 animals for hunting only, fetched R25 000. In the third year 1 800 were culled for red meat production plus hunting, providing R90 000 (of which twenty per cent was from hunting). In the fourth year (projected) 2 800 would be cropped, fetching R140 000 (Arnott 1974). In addition, a small meat-processing factory was built locally at a cost of R90 000 which was repaid in less than a year by the game resource. Hunting was not confined to trophy animals, thus a much larger clientele could be supported by the local ranch populations.

This unique venture has proved the value of game as a capital-less resource which can grow on its own turnover. In Arnott's words (1974), "There's meat for Africa, if you're game." It is now vital for this expertise and experience to be spread across the continent.

Opportunities for Outward Creative Conservation: Seven Spheres of Involvement

The African peoples have suddenly become aware of ways of life not their own and are fired with ebullient enthusiasm about they do not quite know what: nationalism, in a world that must overcome the jejune irrationality of nationalism, and a desire to copy the West in a continent which might better realize its own innate dignity.

Frank Fraser Darling 1960

The preceding sections have shown briefly the complex of interrelations of wildlife conservation, in its widest sense, with the rural human populations which make up more than ninety per cent of those on the African continent. It has also pointed out that all present and future planning of natural areas must be based on the holistic, dynamic approach of regional ecosystems and their particular human and natural features. The static approach of putting a fence around a natural area and planning roads and urbanized camps for tourism within, and ignoring everything outside will lead to extinction of the real values of natural areas and the remains of the large wildlife populations occurring on the continent today. The national parks and related reserves

should not be seen as the last ditch stand of conservationists against development, but as the nuclei for replenishing the vast empty areas of the continent. Only in this way can wildlife and wildlands be saved as an integral part of the continental ecosystem.

For conservation to effectively ensure the present and future viability of natural areas as productive ecosystems, it must take part in far more than what goes on between the fences of these areas. Seven major spheres of involvement are listed in Table 2. For too long, departments have dealt with their subjects in isolation, applying their policies without an integrated approach.

In rural areas different kinds of education are required, which can be related to cultural and regional differences and which will enhance these areas through intermediate technological innovations (Schumacher 1973). There is a unique example in Mali, where ancient cultural achievements were protected by adapting modern techniques for storing grain and water to traditional architecture and storage methods so that these techniques functioned as an invisible technology (Guggenheim 1976). Toffler pointed out in 1975 that there are two contrasting policies in development which should be avoided as they are reversionist or static: Technomania with unrestrained growth, and technophobia with romantic ruralism. Neither one is realistic. Instead regional self-sufficiency, and local economies using technology as a tool is desperately required so that whole countries are not devastated or sucked into world-wide crashes in economy and food production.

The dangers of industrial or old-style thinking (De Bono 1973, Toffler 1975) are compounded when policies of land use and rural ways of life are largely dictated by town-conditioned minds. It is interesting to note that these dangers are now being realized by black Africans, (eg. Omo-Fadaka 1976) predicted seventeen years ago by the eminent ecologist, Frank Fraser Darling. Omo-Fadaka (1976: 216) writes: "Bini traditional religion takes a holistic view of nature, and the people live in harmony with nature and not against it." The industrial economy of towns in Nigeria has "given rise to an elite trained in the application of western technologies and to an urban proletariat available for work in the factories and other large-scale commercial enterprises. Few, however, realize at what human cost. The ignorance displayed by the majority of our politicians as to the true nature of the cultural patterns of the so-called primitive peoples has not enabled them to appreciate their extraordinary value, both in human and even economic terms. As a result, they do not understand what an effective tool of social control such a culture provides . . . Only now is this, the most important and the least understood of all sociological principles, coming to be generally appreciated. In Benin it is coming to be sensed by an increasing number of people, among whom there is growing reaction against the alien western way of life and at the same time, renewed interest in their traditional culture."

In the same way the natural areas of the continent must be seen in their geographical, ecological and cultural African context. The diversity of natural areas in each region or locality should be used in accordance with their intrinsic properties for a variety of criteria – from near total protection, endem-

TABLE 2

Seven spheres of conservation involvement

1. *Rural education*
 - Change of content and emphasis to human and environmental values based on local or regional characteristics.
 - Technological aids as the tools of man.
 2. *Rural land use*
 - Intensive agricultural methods introduced by way of their traditional systems (e.g. *Valley Trust* experiment in Natal using trench cultivation).
 - Capital-less resource production (e.g. protein from wildlife).
 - Replacement of scarce resources (e.g. firewood) by establishment of plantations to save indigenous forests.
 - Self-sufficiency in food production.
 3. *Regional co-relations*
 - (a) Physical – ecosystem diversity, and the role of natural or accelerated landscape changes in the region on the dynamics of the natural area.
 - (b) Economic – in its complete sense, the maintenance and exchange of rural resources.
 4. *Involvement of rural people*
 - Involvement with the protection and management of natural areas (a mutualism drawn from co-active benefits (3b)).
 5. *State-wide involvement*
 - State-wide involvement in establishment of full spectrum of natural areas.
 - Their relation on a state and local level.
 6. *Management of natural areas*
 - Internal management of natural areas based on geomorphic, hydrologic and ecological processes and trends determined by salient factor analysis (management based on causes not effects, using the visible responses as indicators).
 - The internal dynamics must be correlated with the wider framework of changes occurring in the catchment base or region in which the natural area occurs.
 7. *Expertise diversification*
 - Employment (and/or hire) of staff from the following fields unrepresented in southern African conservation organizations: agriculture, economics, education, engineering, geography, geomorphology, forestry, human ecology (anthropology), hydrology, landscape planning, pasture science, soil science.
 - Representatives from rural communities adjacent to natural areas of all kinds of local field propagandists and demonstrators (including: herbalists, beekeepers, hunters, fishermen, teachers).
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ics for example to rural hunting areas. In this way natural areas and wildlife are integrated as part of the whole man-land relationship, well-expressed by Dasmann's (1975) *Conservation Alternative*. This was foreseen in 1968 by a plan for involvement of rural people with the management and protection of Gorongosa National Park in Mocambique. Surrounding Gorongosa are more than 30 000 peasant cultivators, part of whom are fully occupied with bee-keeping which depends on undamaged *Brachystegia* (miombo) woodlands. As the area is occupied by tsetse fly, nagana precludes the use of domestic stock, hence the people are mostly dependent for their protein on the wildlife. On the one hand the plan included total use of a sustained yield culling programme for reducing the hippo and buffalo populations, and on the other encouragement of the use of the miombo system within the park by the beekeepers. In this way a mutualism would be drawn from their dependence on protein supply and undamaged miombo, and the dependence of all on rural vigilance against commercial poachers, unrestrained fireing and hunting, and damage of forests and catchments by shifting cultivation forced by cash crop demands. In short, creative co-operation with the rural inhabitants was mutually beneficial. Unfortunately political changes have left this plan (Tinley 1969) in limbo. However interest and enthusiasm in the cultural and resource values of natural areas in Mocambique engenders optimism over rational land use and the maintenance of wilderness areas there.

The subject of management planning within parks has a copious literature, yet four key features are generally overlooked in practice:

- (a) Each natural area is unique and cannot be managed by an overall plan for all parks.
- (b) The natural or accelerated geomorphological changes in the landscape, from the micro to the macro scale, are ignored or not recognized, resulting in management programmes based largely on effects instead of causes.
- (c) Limits of natural areas and the criteria for their management must be based on geo-ecological features such as watersheds or ecosystems, not on road, fence or river boundaries.
- (d) Emphasis should be on the holistic approach in which the ecosystem is treated as a unit, whose function is determined by "salient factor analysis" (McHarg 1969).

It is impossible to realize the ideal for everything in an ecosystem to be taken into account, and it is neither necessary nor possible to study all the details and complexities in the time available, because determination and protection of the salient factors holding a particular ecosystem together ensures survival of its components and its processes (Tinley 1974).

Some of the literature containing constructive criticism and discussion of man-land interactions related to conservation and frameworks for planning are listed in the references. Of these Forster's (1973) work represents the most recent synthesis of requirements for planning parks. An essential feature of responsible planning is for a feedback of data from an involved public which requires to be educated and informed on human and environmental

values. In this way obscure and covert criteria can be eliminated by involvement of the people for whom the planning is being done (McHarg 1969, Schumacher 1973, Toffler 1975). It is essential that conservation organizations themselves find equal or better alternatives for development or for parks, when their natural areas are threatened. It is not enough to protest, and leave the decision on land-apportionment to the politician or the engineer.

Schumacher (1973) and Toffler (1975) point out that a prerequisite for realizing effective economy, land-use and human services is through regionalisation, decentralisation of authority and activities, so that regional self-sufficiency forms the base for state-wide independence. In the final count responsible conservation planning must be holistic, taking into consideration the human and natural resources of a region to provide a template of salient factors, from which it is possible to anticipate or predict crises or new opportunities to use creative thinking or creative co-operation with the rural inhabitants.

As the destiny of natural areas and rural development, based on human and environmental values, is bound inextricably together, it is unacceptable to have wild ungulate populations confined to parks where their future is in jeopardy from over-population whilst most of Africa suffers from chronic protein deficiency. What is required is replenishment of wildlife populations over the vast relatively empty areas, and their sustained use as a food resource, thus expanding the size of productive natural areas to continental proportions.

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Has Man a Place in Nature?

ROBERT ARDREY

I have been asked to speak on the question, "Has man a place in nature?" I could of course just say 'Yes' and go back to my seat and everyone could sit back in very great relief. The relief would be justified since I have written half a million words and four books affirming the proposition that man is a portion of nature. And if I get started on the half million words you would really be in trouble.

But I won't. I'm going to confine myself. I'm going to make one statement which I'll get back to later: we are a portion of nature and should we succeed in destroying the natural world – our seeming purpose – we would probably destroy ourselves. We are in a mess that we do not quite understand and I am going to do something which I hope does not bother too many people. With one reservation, I am going to blame it all on God. Western civilization has been nature's prime enemy and the prime dynamics of Western civilization has been the Judeo-Christian religion.

We have had others who have asked us to think back to Genesis and I am going to ask you to think back with a much more unfriendly tone. Of course some people are on better terms with God than I am, so I can't criticize. But we will go back to that famous sixth day of Creation in the Garden of Eden, when God blessed us and told us to be fruitful and multiply. Oh boy, did we do that! We should go forth and conquer the earth and master all the fish in the seas, all the birds in the heavens, all the animals on the land. So we did. How we did! In *The Hunting Hypothesis* I described these instructions from God as a free sanctified one-way ticket to catastrophe. As I say, I have heard Genesis quoted here in friendlier fashion. I'm being unfriendly as part of my mission on earth is to go out and say wrong things – and South Africa is some wrong country to say them in too by the way! I truly apologize if this seems blasphemous because I assure you it isn't. You see, I don't believe in God so I can hardly blaspheme Him. I certainly don't believe in the kind of God who was in the Garden of Eden. Genesis was written by men and they wrote God's part the way they wanted it. I am a playwright and when I write an actor's part I write it the way I want it – and that is how men wanted the little quotation from the sixth day of Genesis.

I suspect that for many centuries after Genesis was put together people didn't do too badly as a result, but in time how literally we came to take these words, particularly we of the West. How we slaughtered the animals, shot down the birds! Maybe we did get a little confused – we thought whales were fish and that's why there are hardly any whales left. Now, this Judeo-Christian error – as I claim it to be an error – was it trivial? I don't think so. I think we should all consider it very carefully because one of the things that any

conservation movement is up against is the philosophy – not only inertia, not only profits, not only problems of that sort – but it is the prevailing philosophy that has to be fought. And that is our prevailing philosophy: that the world is ours.

You must remember that only in the most recent decades has any moral question ever been brought up about destroying the wilderness. It's a very new idea, conservation itself. We think of President Theodore Roosevelt early in the century in America, pioneers like Stevenson Hamilton and Kruger backing him, in South Africa. These were early fellows and in fact the very earliest of the game parks and reservations were the parks of the nobility in Europe where they conserved animals to shoot them. But true conservation has all happened in this century and my suspicion is that not until the energy crisis came along was there a sudden recognition that natural resources are finite. So world conservation takes on a real meaning and a congress like this becomes possible. I truly doubt that this congress would have been possible and that you all would have been here, I would be here, if we hadn't had that Arab boycott of oil and suddenly sat back and said to ourselves, "Wait a minute, what's going on, what's going on?" I'm sure it's true that there are Americans who still don't know what's going on.

It has occurred to us that we do not own this planet, as Genesis implied, and Western civilization implemented. We are guests on this planet and we had better behave ourselves. I take this philosophical problem seriously. For centuries in the West, in any choice between human utility versus natural conservation, utility won. And believe me, our socialist states are no better than our capitalist. It has not just been greed and profits. And the Third World – what does everybody want but the fruits of Western civilization? So the forests vanish, giving way to fields, and clean estuaries disappear, the plastics plant has come and polluted them. And the breeding territories of the fish? Well, God said it was all right. We think about these things and I am an American and I have a load on my conscience as an American, because when it came to destroying nature we were the pioneer savages in the course of conquering a continent. Let's think of birds in the heavens and how fast we shot off billions of passenger pigeons. The last one died not decades ago.

Or the buffalo: we didn't even shoot it for meat, we just shot it. We shot anything that moved and if an Indian came along, we shot him too. So today it is interesting that the Americans are pioneering guilt. With our history we perhaps feel it stronger. In America environmentalism is a powerful emotional movement, sometimes almost frightening oil companies – which is a feat. I really believe that amongst contemporary peoples the Americans are more worked up about conservation than anybody. I don't know how many Americans are here, but there are quite a few and I am very proud of you when you consider what the political climate in America concerning South Africa is today. I am proud of everybody who has come here despite politics, because what in God's name has nature got to do with politics?

I want to tell you a very short anecdote. I was staying in New York one time about two or three years after Rhodesia's UDI. I always stay at the Algonquin Hotel, everybody knows me and they said, "There's a fellow here

who's looking for you." I said, "Fine, tell him to call my room." He happened to be in the next room to mine and who was he? He was the director of the Rhodesian National Parks, and he was in New York trying to scrape up some money for the Wankie Reserve. I got so depressed, and I thought of a few contacts I had and I knew nothing was going to happen. And he went back to Rhodesia without a dollar. And that was the first time I said to myself, "What kind of people are we? Should God ever have had a talk with us? Maybe he should have had a talk with sharks, they aren't political." How much we must learn. I have said that man is such a portion of nature that to destroy it we destroy ourselves. That's not just rhetoric; one speciality of mine has been human evolution, and I am so aware of those millions of years that we lived, not as a master but as a species, just one among other animal species.

The oldest discoveries these days in Tanzania are by Mary Leakey, the widow of Louis Leakey, and they go back to 3,750 000 years, more or less. We can say roughly four million. And our ancestral fellow wasn't that different from us. You know, he had a little brain, but what the hell is this big brain if we don't use it? I would trust myself more, probably, with the hunter of four million years ago. He did not destroy his habitat. No animal destroys his natural habitat – only people do. Of course all this early evolution, except the last few hundred thousand years, took place in Africa. Then came the Ice Age when very important advances in the human being took place in Eurasia. Even so, when the last ice sheet retreated, we still remained, as hunting beings, one species among others, all with our place in the natural world.

Then came the great change. Shortly after the retreat of the last ice sheet, we began to domesticate certain animals and plants. We gained control over our food supply. Formerly we were partners with nature, in the sense that we had been hunters and the natural world provided us with prey. We were just as much partners as the lion or the wolf. But then we gained control over our food supply. And I think – considering that domestication began only ten thousand years ago – I honestly think that the inspiration for Genesis came about through what the Greeks called *hubris*. When we came to make sheep and cattle our slaves, when we learned to cultivate wheat and barley and legumes, we were no longer just another animal species. We were the master species. And we were. We had our peaceful fields and our placid herds, and if the wolf came along we killed him without conscience, since he was our enemy. No longer were we that ancestral man, remarkable, wonderful, magnificently evolved but still dependent on the natural world and its supply of prey. We were now the dominant species, master of all others. But just as kings at a later date found a need for divine authority, so we needed Genesis.

Yet a "Catch-22" slowly appeared. Through all our evolving years *adaptation* had been the human genius. We adapted ourselves to nature's demands, we had never attempted to adapt nature to ours. Our drive for survival was enormous, as was our capacity for adaptation. We survived millions of years of African drought. We adapted, even in our small-brained days. Then for reasons which I have never clearly understood, when the early Ice Ages hit Europe and Asia and the weather turned rotten, there we were

adapting like mad. Just why we should have migrated from warm Africa to menacing Europe is another thing which I have never clearly understood. Maybe we had developed a taste for lousy weather – or perhaps we were seeking challenge. In any case, we adapted. We made our compromises, during the final glaciation known as *Wurm*, emerged *Homo sapiens* – ourselves. Our genius for adaptation had permitted us to survive the worst agonies that nature could throw at us.

We are now talking about survival, just as one-celled creatures had talked about it a billion or two years ago. What to do? Adapt. But now, in the short term before Eden, we changed our strategy. Not to adapt, but to master. Not to accept nature, but to declare war on it. Not to remain its natural partner, but to declare it our enemy.

I must now ask the question about Western civilization: is it possible that the human being can survive anything but the creature of its own creation – civilization?

I speak to conservationists. I remind you again that your most intolerable enemy is not material but the things we believe in. Like growth. Like pleasure. Like a host of social ideals, all wrested from nature at nature's cost. Like security, something nature never thought of. I must make a dreadful prediction concerning Man versus Nature. While we do everything in our enormous power to check it, still we predict a doubling of the world's population every twenty years or so. I must suggest a halving. Famine, disease, the stress of overcrowding, human despondency in the face of eternal, overpowering nature, must take its toll. Nature's resources are limited in the face of a species' unlimited wants; nature's resources for reprisal know no limits. We took on an enemy too large.

I speak pessimistically. We are beings of the wilderness, we evolved in the wilderness, and when we enter the wilderness our hearts expand. Yet surely no one at this conference is so naive as to believe that we can preserve it for the earth's teeming billions. Yet preserve it for a portion of us we must, just as we must preserve it for that widening number of us who, through our contact with nature, come to know that we have our place in it. And that a philosophy of enmity with nature, that an urge to reduce the wilderness to extinction, is a philosophy of human extinction. So I speak pessimistically.

But there is the other side of the coin – adaptation. If, for a few thousand years, the destruction of the natural world has been our driving ambition, let us not forget that the making of *Homo sapiens* was his capacity to adapt. If the civilization that we cannot master so easily as the fish in the sea, the birds in the air, the animals on the land – if the civilization of our own creation was something God didn't think of, well then we must. We must summon up all our ancient capacities for adaptation to adapt our civilization to the natural world.

Raising the Standard of Living by Means of Large Technical Developments Without Endangering the Flora and Fauna

EDMUND L. DE ROTHSCHILD

The Greeks had an apt adage which would seem to sum up the values of wilderness and of the theme I have chosen : "Life is the gift of nature, but beautiful living is the gift of wisdom."

In the late Professor Bronowski's book *The Ascent of Man*, I came across this cogent line of thought: "When I was a young man, we all thought that mastery came from man's domination of his physical environment. Now we have learnt that real mastery comes from understanding and moulding the living environment." That is how man began when he put his hand on plant and animal, and in learning to live with them, changed the world for his needs. I do not want to take issue with ecologists and environmentalists, but I would like to attempt to outline some of the progress of mankind which has brought us to today's world, though I share with them some of the apprehensions of modern technology. We are not seeking a mechanical Utopia, but a utilization of science that can give us an aid to keep our roots firmly grounded in the rich heritage of the past. We can say to the children who left school this year what the aged Voltaire in 1778 on his last journey to Paris before he died said to the youth in whose hearts he sensed the grandeur of the coming century: "The young are fortunate: they will see great things."

And certainly they did, for the nineteenth century was the age of the industrial revolution which wrought enormous changes in the living conditions of a great section of the population. Cities spread out and advanced into the countryside, devouring vast tracts of land. Industry in its wake brought factories beside previously unpolluted rivers. Man's desire for progress advanced blindly, rushing headlong with ever increasing speed, without any regard for the preservation of the environment. Technology in our time has added dimensions thought impossible before. Its sophistication is such that everyone has more time for leisure. Travelling is within the reach of more people than in any previous era in history, and this has caused an invasion into territories previously inaccessible, but now reachable due to modern transport. It is therefore imperative that people everywhere should be made aware of their precious environment, and educated from an early age to respect the world around them.

The ascent of man to the pinnacle on which he now stands is strewn with the bones of animals and birds annihilated, flora recklessly desecrated, the beauty of nature despoiled and polluted. We stand in danger of being the generation that could be cursed by its descendants for having been amongst

the greatest squanderers of the earth's resources. Yet there are voices urgently raised today trying to match the benefits mankind expects with the preservation of what is left of flora and fauna, who have the inalienable right to exist alongside us in our civilization. I must qualify the word civilization, for modern weapons of war such as we have now can destroy mankind and pretty well every other living thing as well.

A few years ago I had the opportunity of visiting Amazonia, and before going there read a most interesting book by Henry Walter Bates, called *The Naturalist on the Amazon*. He lived in those unspoilt parts of Brazil before it had been explored. His book ends with the following words:

"What has struck me powerfully is the immeasurably greater diversity of interest of human character and social conditions in a single civilised nation, than in equatorial South America, where three distinct races of man live together. The superiority of the bleak North to tropical regions, however, is only in their social aspect, for I hold to the opinion that although humanity can reach an advanced state of culture only by battling with the inclemencies of nature in high altitudes, it is under the equator alone that the perfect race of the future will attain to complete fruition of man's beautiful heritage, The Earth."

Bates could not have foreseen, in 1863, the despoilation of large tracts of forest land in the Amazon region, the wilful destruction of many of its inhabitants, man included, all in the name of social expediency. For each generation expects its government to carry out projects, some small, some large, to aim at improving their standard of living at whatever the cost to our environment.

But not all enterprises are wholly destructive, and I would now like to refer to a more positive aspect of a development with which I have been personally involved for the past twenty-five years. Amongst those who foresaw the harnessing of nature for the beneficial use of all were three men with whom I have been directly or indirectly connected. They were Winston Churchill, John McLean and Albert Peter Low. Let me tell you how these men influenced me. It was because in 1952 I became involved in an immense hydro-electric development in Labrador.

The first to whom I want to refer is John McLean, a Hudson Bay employee who, in the middle of 1839 undertook an arduous journey into the cold and unexplored centre of Labrador. In his report to his seniors, he wrote:

"After one day's rest, we embarked in a canoe sufficiently large to contain several conveniences, to which I had been for some time a stranger – a tent to shelter us by night, and tea to cheer us by day; we fared, too, like princes, on the produce of 'sea and land', procured by the net and the gun. We thus proceeded daily on our downward course without meeting any interruption, or experiencing any difficulty in finding our way; when, one evening, the roar of a mighty cataract burst upon our ears, warning us that danger was at hand. We soon reached the spot, which presented to us one of the grandest spectacles in the world, but put an end to all hopes of success in our enterprise.

"About six miles above the falls, the river suddenly contracts, from a width of six hundred yards, to about one hundred yards; then rushing along in a continuous foaming rapid, finally contracts to a breadth of about fifty yards ere it

precipitates itself over the rock which forms the fall; when, still roaring and foaming, it continues its maddened course for about a distance of thirty miles pent up between walls of rock that lie sometimes to the height of three hundred feet on either side. This stupendous fall exceeds in height the falls of Niagara, but bears no comparison to that sublime object in any other respect, being nearly hidden from the view by the abrupt angle which the rock forms immediately beneath it. If not seen, however, it is felt. Such is the extraordinary force with which it tumbles into the abyss underneath, that we felt the solid rock shake under our feet as we stood two hundred feet above the gulf. A dense cloud of vapour which can be seen at a great distance in clear weather hangs over the spot. From the fall to the foot of the rapid – a distance of thirty miles – the zigzag course of the river presents such sharp angles that you see nothing of it until within a few yards of its banks. Might not this circumstance lead the geologist to the conclusion that the fall has receded this distance?"

In actual fact, when we came to survey the area, this proved to be completely accurate.

Sir Winston Churchill, after whom these falls and river are now named, was also greatly impressed by the power of water. As a young man in 1908 he wrote a book, *My African Journey*, in which he describes one of the sources of the Nile which flows out of Lake Victoria in Uganda:

"The Rippon Falls are, for their own sake, well worth a visit. The Nile springs out of the Victoria Nyanza, a vast body of water nearly as wide as the Thames at Westminster Bridge, and this imposing river rushes down a stairway of rock from fifteen to twenty feet deep, in smooth, swirling slopes of green water. It would be perfectly easy to harness the whole river and let the Nile begin its long and beneficent journey to the sea by leaping through a turbine. It is possible that nowhere else in the world could so enormous a mass of water be held up by so little masonry. Two or three short dams from island to island across the falls would enable, at an inconceivably small cost, the whole level of the Victoria Nyanza – over an expanse of a hundred and fifty thousand square miles – to be gradually raised six or seven feet; would greatly increase the available water-power; would deepen the water in Kavirondo Bay, so as to admit steamers of much larger draught; and, finally, would enable the lake to be maintained at a uniform level, so that immense areas of swampy foreshore, now submerged, now again exposed, according to the rainfalls, would be converted either into clear water or dry land, to the benefit of man and the incalculable destruction of mosquitoes."

What great vision Churchill had: In his later life I had the privilege of keeping him informed of the progress we were making in Labrador. I was very fortunate to have been amongst the first thousand Europeans to visit the falls in this bleak and inhospitable part of the world. In those days, and I am speaking of the early 1950s, we used to fly in single-engined Beaver float aircraft, and I wore a red anorak so as to be easily spotted in the event of having to make an unexpected forced landing. It was Churchill who, during his last administration as Prime Minister, in 1952 introduced Premier Smallwood of the province of Newfoundland and Labrador to my bank – N.M. Rothschild & Sons. Not only did he tell the premier that his idea was a 'grand imperial concept but not imperialistic', but he also wrote about the falls that 'it was high time that the Hamilton Falls wore a bridle.' It was only after his death that Premier Smallwood re-named the river and falls after the great man.

We thus formed the British Newfoundland Corporation, Brinco, which developed the seven million horsepower or 5 225 million kilowatts of power from these great falls at one site.

The third man with whom I have been indirectly connected was the Canadian geologist, A.P. Low. In 1907 there was a Senate committee hearing in Ottawa, on Canada's fertile northlands. Low gave evidence and with remarkable forethought told the committee the following:

"There is a great supply of iron in Labrador which will probably be valuable in the next twenty-five years. The greatest difficulty in making this iron ore commercially valuable, is the problem of transportation, but there are several millions of horsepower in the Grand Falls of the Hamilton River, and in addition to mechanical horsepower, it would also furnish the heat whereby an electrical process, the reduction of the ore by electricity might be performed. Transportation might also be provided by electric power."

In so many hydro-electric developments of high-headed hydro, vast tracts of land have had to be inundated causing existing life in the area to change dramatically. But it is pertinent to ask, perhaps naively – did not capricious nature sometimes alter the world as dramatically, even more so by some of her cataclysms of ice ages, floods, droughts, high winds, earthquakes, volcanic eruptions, and so on?

Throughout the ages we have been conditioned to accept these major disasters as an act of God, yet in one stroke they can transform a vast region and destroy the whole pattern of life wherever they occur. I personally think we should accept some of the man-made changes of our environment as the world population explosion demands some sacrifice.

To revert to the development of the Churchill Falls in Labrador, I would like to give you some idea of its magnitude. Enough rock was taken out of the underground power-house 304 800 metres below the surface to fill thirty eight ton trucks, nose to tail, for eight hundred and eighty-five kilometres. Each of the eleven turbines and generators would fit into a nine-storey building, and incidentally we inundated an area the size of Wales, without displacing a single person.

Just when we were almost complete, a year ahead of schedule and within our budget of \$1 073 million, Premier Moores, Mr Smallwood's successor from a different political party, decided to nationalize our enterprise. To ensure that the balance of nature in the interior of Labrador was not harmed, Brinco had previously carried out researches into the effect of this development on all forms of animal and vegetable life. It was found that possibly only five species of mice (the northern lemming mouse, the deer mouse, the red-backed mouse, the eastern phencomys and the meadow vole) would be unable to swim the icy waters to or from the islands formed by the flooding. In effect what really happened was that the mice were able to escape over the ice. Many were actually trapped live and transported out of the area involved, to remain part of the food cycle of the many predators who were not affected in the same way by the rising waters. A natural increase in the population of mice took place which in turn increased the predators, and even the eastern cougar has now returned to Labrador – that rare and beauti-

ful species of the cat family whose fur is thicker and darker in colour than its western counterpart due to the cold climate, often sixty below zero. A type of grass indigenous to the north of Canada was seeded on to the eskers or dykes, and where less than one hundred Canada geese nested, there are now more than a thousand. A benthamitic survey for assessing any damage or otherwise to aquatic life was undertaken. The quantity of fish has trebled both in numbers and in size. Ouananiche, the landlocked salmon, which previously averaged 2,2 kilograms now often exceeds fifteen in weight, and this is due to the increase in the feeding matter caused by the decay of the flooded areas.

Was not something similar carried out in Operation Noah's Ark on the great Kariba Dam development here in Africa?

Adjacent to South Africa is the Courtauld's pulp mill in Swaziland. Up to recently one of the devastating problems concerning the extraction of pulp was the water needed for the process, which was discharged as a highly toxic effluent into the adjacent river. Courtauld's and its partner, the Commonwealth Development Corporation, spent a lot of time and money on achieving the solution to their problem – as have many other paper mills. In Swaziland the lovely Usutu waters are used for your requirements for paper and board making. They are now recycled unsullied into the river.

Besides the Churchill Falls development, which is a high head hydroelectric project, as a means of producing power, another form of creating energy is in low head hydro. It has been found possible to harness the flow of rivers in cascade whereby only a small amount of water has to be impounded – probably in a lake near the source of the river or its tributaries so that the flow can be partially regulated. The beauty of the new form of turbine used in low head hydro, whose generator is in the rim, is that it can be submerged and one would not see large concrete dams. The power-house could be situated away from the area of scenic interest, or even underground; only a cascade or a small waterfall would be visible and this, after all, is usually very attractive. Fish can pass both ways through these turbines, there being little pressure involved. If the river is navigable, locks can easily be built for the passage of boats. With intelligent landscaping using trees and shrubs, a greater sense of beauty can be added. This low head hydro is applicable in many areas, and can give us the much needed energy for which we are all so desperate. For example, in the United States of America alone, there are some 49 000 sites known where low head hydro can be developed to produce around 183 million kilowatts of power – and this excludes tidal power, where, if the tides are of sufficient magnitude, they can be harnessed by means of low head hydro turbines.

Clearly, it is indeed possible to transform the landscape significantly to the benefit of mankind without at the same time having to despoil the environment. Sadly, the list of such developments is not endless although I personally believe that it could be made so given imagination and goodwill. In this connection I have written to several companies in different industries to ask them for details regarding their efforts concerning the environment.

About a hundred years ago the famous German philosopher Nietzsche

wrote: 'Inescapably, hesitatingly, terrible like fate, the great task approaches: how should the earth as a whole be administered? To what end should man, no longer a people or a race, be raised and bred?'

Modern man is technically competent to harness almost limitless energy and to provide food and shelter for the 3,7 billion people now estimated as living on earth, and this could rise to perhaps seven billion by the year 2000. I think that our greatest challenge is how to keep pace as spiritual beings with the accelerating snowball of our discoveries. Can we control the elements, harness nature itself and still retain our humanity? I personally am an optimist, for to be a pessimist is a negation of everything. But optimism must be tempered with realism.

Teilhard de Chardin, the French theologian, so very wisely wrote: "Some day after mastering the winds, the waves, the tides and gravity, we shall harness for God the energies of love, and then for the second time in the history of the world, man will have discovered fire."

Where are All the Elephants Going?

I. DOUGLAS-HAMILTON

To me elephants epitomize the wilderness. They need space, and in Africa and Asia they still range from burning deserts to dripping rain forests, and almost from the snows down to sea-level. In Kenya in August 1977 my wife Oria and I were down at the coast north of Lamu, and we actually found them on the sand dunes and spotted a bull that had swum or waded out through the mangroves and clambered up on to a small coral island to sample the vegetation. He was standing there with the wind blowing his ears forward, overlooking the great waves smashing up against the cliffs on the seaward side.

Yet today, on the surveys I fly in Africa all too often I cross miles of harsh landscape where until a few years ago elephants thrived along the water-courses. Now I may find bones, a skull or two, sometimes a corpse held together in its dried-up skin like a mummy, and often these spread-out carcasses are the only sign of elephants. Sometimes drought is blamed, more often man, and we ask the question, "Where are all the elephants going?"

To answer the question and to find ways of preserving the elephants and their wilderness presents man with more problems and paradoxes than does any other animal. Of all wild animals elephants interact with man the most, and whether as raiders of crops, destroyers of woodlands, earners of tourist revenues, or providers of ivory, there is always lively debate over how they should be preserved, conserved, hunted or managed.

When I first began my research in Manyara National Park, Tanzania in 1966, the elephants lived peacefully. The burning issue facing scientists and wardens was whether or not there were so many elephants that they should be culled. By 1970 it was generally accepted that these problems of elephant over-crowding were usually caused by the concentration of "refugee" elephants within protected areas where they could escape human harassment, and where they proceeded more often than not to destroy mature trees faster than these could regenerate. Large populations still abounded in unconserved areas where human density was low, in East Africa and elsewhere.

Then one factor changed suddenly and further upset the man and elephant relationship. The price of ivory increased ten-fold to around \$30,50 a kilo. The volume followed suit. For example, Kenya's customs figures which in the 1960s showed an annual average export of about forty tons, increased to 213 tons for the year 1973. We have recently weighed thousands of tusks in Dar-es-Salaam and an average pair of tusks weighs just under ten kilos. If this average holds true for the rest of Africa, it means that one ton of ivory is equivalent to roughly 100 elephants. In fact, official export figures from Africa are often as much as fifty per cent too low, since the price rise has given

profiteers the means of bribing and smuggling on a scale which is exceeded only by the international traffic in drugs.

A more reliable indication of world trade in ivory can be gained from the importing countries. In 1975 Hong Kong alone imported 515 tons. By the end of 1976 Hong Kong imports had swelled nearly forty per cent to 710 tons of ivory, roughly equivalent to 71 000 elephants. This rate of trade would account for South Africa's entire elephant population in just over a month. These Hong Kong imports are perfectly legal, but even so customs officials have discovered ivory being shipped in disguise as machinery, and on one occasion a box broke open spilling out a pile of tusks. Admittedly some of the Hong Kong ivory was imported from intermediate countries, but Africa is also exporting raw ivory directly to Japan, China, India, the Middle East, Europe and America.

In all, ivory leaving Africa in 1976 may have come from anything between 100 000 and 400 000 elephants and there seems to be no slackening in the demand. In August 1977, headlines appeared in the *New York Times*, "Whether for love or money, demand for ivory soars."

Can the elephants sustain such a yield? This is the question which the Survival Service Commission of the IUCN have asked the Elephant Specialist Group to find out. We are supported by the W.W.F. and the New York Zoological Society, who provide funds for a small staff and the means for getting around by light aircraft. The research is intended to lead to an action plan.

Our work is regrettably no longer the intimate study of known elephants. Nowadays we can snatch only a few weeks in a year to visit Manyara. We have set up an office in Nairobi and developed a network of informants across the continent, of scientists, wardens, hunters and farmers who act as an early warning system to tell of elephants in danger of extinction. A similar secretariat exists for the Asian elephant which is already classified as endangered.

In areas of special interest we carry out our own spot surveys, and using total counts or sample transects – we make detailed estimates from the air, which include information on human settlement patterns and elephant carcasses. From both the indirect and direct research we now have a fair idea of the elephant situation in Africa, a picture which steadily becomes clearer as more people, organizations and governments pool their information with us.

I can hardly begin to summarize these results, but I will try to show the complexity of the elephant's situation in a few examples. It is generally true to say that elephants face three threats to their survival.

The first is straightforward human predation, mainly for ivory but also in defence of crops. Licensed hunting never posed a threat, until recently when the temptation of short term profits overcame the scruples of some hunters. The second threat is loss of range associated with a rising human population, an inevitable process which can only end when human population is controlled. The third threat is the habitat degradation within the elephant sanctuaries, caused as a direct result of compression.

The general continental picture is one of decline. The northernmost elephants live in Mauritania, but not one has been seen in the last ten years;

only their droppings indicate their existence. In Chad it is reported that the army has used rockets to shoot at elephants from helicopters. In the Ivory Coast a Minister remarked that, unless draconian measures were taken to curb the poaching, the country would need to change its name. In Sudan I have received very recent reports that some tribes are still burning elephants to death by setting alight the long grass around a herd. Even if elephants escape the flames their feet become charred as they walk over red hot ashes and lame elephants are an easy target for spears.

From more accurate counts than are available for most countries, we know that Kenya has lost more than half her elephants since 1970 and now has a population in the region of 55 000 to 75 000. Our counting today often records more carcasses than living elephants.

Uganda has shown an even greater decline and within the Kabalaga National Park itself, the number of elephants has fallen from 14 000 to just over 2 000.

In West Africa, in countries such as Ghana, Liberia and Sierra Leone, the elephants are hunted for their meat rather than their ivory. Human density and protein deficiency are much higher here than elsewhere.

Of thirty-three countries in Africa that have elephants their numbers are probably declining in all but four. These are Somalia where the government has armed the tribesmen, Ruanda where all but twenty-six were eliminated in a shooting programme in 1974, Botswana and South Africa where most of the elephants were exterminated over a hundred years ago, but where the remnant is now strictly protected.

But, at least in Tanzania there are huge wildernesses, and even though their legislation and definition of wilderness may not be as advanced as in South Africa or America the fact remains that they have the largest concentrations of wildlife anywhere in the world. In 1976 a survey I made estimated 100 000 elephants in the Selous Game Reserve; a month ago another survey revealed 40 000 in Rungwa and Ruaha. Only a week ago we flew over the Serengeti where 1 300 000 wildebeeste make their annual migration.

In all there are probably at least 300 000 elephants in Tanzania, and policies of conservation are actively propagated throughout the ranks of political leadership, down to the grassroots. There are some very dedicated Tanzanian wardens, who keep their parks running well, and keep the poachers at bay with very little logistical support.

Our minimum estimates indicate over 1,3 million elephants in Africa though numbers are no safeguard in themselves. The hardest paradox of all to explain is the overall decline of elephants in ninety per cent of their range and overpopulation in the remaining ten per cent.

As an outcome of the surveys the I.U.C.N. elephant group has developed a four-point action programme for elephants, dealing with research, economics and education. Having identified specific problems, we pass on our suggestions for remedial action to the I.U.C.N. for governments of countries which still have elephants.

The research programme is a continuing development of our surveys. We would like to use new techniques like radio-tracking from satellites to de-

termine forest ranges and to census forest elephants with infra-red sensing techniques.

Under direct conservation the most essential need is to reinforce anti-poaching efforts, but here we meet another paradox. Within the overcrowded parks there is often an overwhelming necessity to reduce elephant density with shooting. At the same time, to win the support of local people, elephant barriers are often necessary to protect elephants from people and vice versa. They can change attitudes as in the Aberdares where the local Kikuyu have no grudge against elephants now that their farms are protected by an elephant ditch. The same could be said of the citrus farmers around the Addo National Park in South Africa. After all, if you can lose half your annual income in one night when elephants destroy your crops you are unlikely to be sympathetic.

Conversely, bringing direct financial benefits to locals from elephants and other wildlife, from tourist revenues, cannot be overestimated.

The second vital means of preserving elephants is to control the trade in their products, but here again we are faced with a paradox. Kill the trade with import bans and you may remove any economic incentive for keeping elephants in tourist areas. Alternatively, let the trade continue and, however good the controls you devise, they are likely to be evaded by dealers with generations of experience in smuggling ivory out of Africa.

We ask the question, is there either the ability or the will within the trade to regulate itself? What are the long-term attitudes of ivory dealers to the future of the trade? If the present course of over-exploitation continues, we fear that the survival of most elephant populations, like those of the great whales, will be placed in jeopardy. To control the trade, we need first to understand it. It seems that over half the elephant population of Africa may become extinct within the next five to ten years.

I have not yet touched on education and public awareness as a key to the elephant's survival, but the way people think of them is vital. For instance, on the shores of Lake Chad lives a tribe who do not kill elephants because they believe they are descended from them. In Ethiopia, the elephant was held to be the most holy of all animals because of its sexual moderation and is frequently depicted in the ancient rock churches. The Ethiopians knew the art of elephant-training in the Middle Ages and it may have come to them from the even older African civilization of Kush, who may have trained elephants for war as early as 800 B.C. – long before the Ptolemies used African elephants in Egypt, or Hannibal marched his African elephants over the Alps to strike at Rome. Sadly, war is raging now around one of Ethiopia's last remnant elephant populations in Harar. There is much in African culture, folklore, and tradition which could be harnessed to conserve the elephants and their wilderness.

Unfortunately, today the most frequent attitude, as one Ugandan park warden told me, is that the quickest way to get rich is to kill an elephant.

Explanations of global strategies for conservation all too often take us away from the heartbeat of the wilderness. All that we have recommended for the preservation of elephants implies new rules and regulations. Yet to

breathe, the individual must break away and go beyond the reach of other men's territories. So I present you with the final paradox: for elephants and wilderness to survive, humanity's activities must be curbed and controlled by other human beings, yet this control and policing destroys much of the spirit of the wilderness.

There are still some wild unspoilt elephant ranges left where you can walk up to an elephant on foot by yourself, but to find them as an individual you have to search, for you will seldom find them in the guide book. You will need to be self-sufficient and adventurous, and then you may find true wilderness.

As Baker, the explorer of the Nile remarked in 1896: "Being charged by an elephant is a new sensation – very absorbing for the time, and would be an excellent relaxation once a week for overworked men in high office."

The American Hunter Conservationist: The Role He has Played in Africa

HARRY L. TENNISON

When speaking of the American Hunter Conservationist we must start with President Theodore Roosevelt, for he was the one who brought so much attention to Africa after his trip to East Africa, and it was after his experiences as a big game hunter that he turned more to conservation, as so many big game hunters have done since that time.

Those of us lucky enough to have enjoyed the beauty of Africa twenty-five years ago, are today the ones trying to put back what we were so fortunate to have had the opportunity to take. Africa gave us a new horizon, a new exposure, a new experience, and certainly for myself, a new way of life.

I never knew what conservation was except in the words of my grandfather, a Scot who spent most of his adult life trying to copy the whisky of Scotland. They called his product bootleg whisky in Texas and of course it was illegal at that time, but it never seemed to bother all the other Scots who came by after services on Sunday and sampled a small portion of his "white lightnin".

One thing about my grandfather, though, was his outlook on taking care of the land and why you should do this. He told me once, "Son, if you take care of the land the land will take care of you." Things haven't changed since then. We merely refer to what he said as conservation in action. Everything else, ecosystems, habitat management, game management, and all the other terms applied to taking care of the land, which also means taking care of the animals, is conservation in action.

My own definition of conservation is just as simple. Conservation to me means the proper use of our natural resources. Today I am primarily concerned with those resources which are renewable.

Since so many of us, especially after World War 2, started coming to Africa – we who were raised on the land, or rather out in the country away from the asphalt jungles of the cities – we not only fell in love with the enormous amount of game, but also the great expanses of the game areas, especially those of East Africa.

As we fell in love with the game of Africa and the vast sweep of the game areas, we could not help but notice as the years went by how the numbers of game and game areas were decreasing. By then we were acquainted with the words habitat and environment and at the urging of people such as Ian Player and Nick Steele of South Africa, Billy Woodley, Peter Jenkins and David Sheldrick of Kenya, and Brian Nicholson of Tanzania, we decided to try to help in this new thing called conservation.

At first we did a little through our connections with zoos, but that wasn't enough. We could take only so many animals over to the United States and

that really didn't do much about the poaching that seemed to really increase with the number of visitors to Kenya, for every tourist wanted something to take home, such as a leopard purse or coat, or an ivory carving, or lion and leopard claws for jewellery, or a zebra rug for the floor.

The hunter very rarely took any of the things I have mentioned. He was usually satisfied with what he had collected on his safari, or from the natives he met in the bush. I have never met more than two or three hunters who might have purchased some of the items I have mentioned, but I have seen tourists by the hundreds buy leopard, zebra and lion skins and ivory.

From talking to my friends the professional hunters and to people like Ian Player and Nick Steele I knew that something had to be done to stop the trade in game-animal products or by-products because each year the trade in them was doubling.

In 1967 at San Antonio we held our first big game hunters and fishermen's conference. No one knew what was going to happen, but some of us hoped what would happen – and it did! We talked conservation, from early in the morning to sometimes early the next morning.

The reason for this first conference of its kind arose from the thinking of the people I had grown to know and admire since the early fifties when I first went to Africa. I had heard many stories about who had done what, who had said what, and so I decided that we could have a lot of fun, destroy a few myths and take a look at all of the people who hunted Africa and then we could see for ourselves if some of them had horns, wings, or just possibly clay feet. You must realize that at this time in our lives, the great heroes were the big game hunters who came back from Africa with their pictures and stories of the dangerous situations they had been in and all the other things that people believed about Africa. Little did they know that we all felt safer sleeping soundly in a tent, under an acacia tree, deep in the bush country of East Africa than we did driving down one of our modern freeways or walking the streets of New York or Washington D.C.

We collected the people – over five hundred and fifty of them from fifty-three countries of the world – and Game Coin was born. I think Conservation International is the correct name, but if you take the word game, the first two letters of conservation and the first two letters of international it reads Game Coin. I thought this up while flying to Nairobi to speak on the value of wildlife and I had to have some organization to represent, so I thought this up and it stuck.

Since 1967 the hunters of the world have raised quite a bit of money for conservation. Our first project was for gasoline, or petrol, for two game wardens in Kenya. It all started with Tony Dyer, the president of the East African Professional Hunters Association and Billy Woodley, the game warden of the mountain national parks in Kenya. These two close friends of mine, who had been to the first conference, suggested that our new organization could really help, at that very moment, by supplying the money for enough petrol to transport a beautiful leopard – which had been killing sheep and had been trapped by the game warden at Thomson Falls – to another area, the Tsavo. We would be able not only to save the leopard, but would have a

wonderful opportunity to see what happened when an animal like this was translocated. I wrote out the first cheque, for \$3 500, which started the first Game Coin project.

Before this I had been a member and later the president of Shikar-Safari Club International and we had contributed a Land Rover for use by the game department of Kenya. We saw the vehicle only once after it was given and then it was being used to transport VIPs around Nairobi and none of us were too happy about that project; so now with Game Coin taking a firm step we were headed in another direction.

Another hunter-conservationist who had also started something along the same line was Mrs. Kellogg of New York, who instituted a fund to help out the game wardens. She is a very quiet person who managed her schemes unobtrusively, but they were and still are very effective.

Today, eleven years after the start of Game Coin there are over thirty different organizations, some that were in effect before 1967 and a lot more which have been begun as a result – we like to feel – of our first conference in San Antonio, Texas in 1967. Over a hundred different projects have been implemented in the past ten years, a great deal of them financed by organizations whose board of directors are mainly hunter-conservationists in the United States. Most of that money was raised by hunters.

The hunter has contributed a minimum of one hundred million dollars to the economy of those countries where hunting has been carried on, either in the form of game licences, or game fees, or the costs of safaris, whether they be hunting, photographic, or bird shooting and fishing. He has contributed equally generously to conservation projects.

Because of the hunter telling his story to millions of people, interest was created and visitors who did not hunt at all started to flood Africa, either taking luxury safaris or being drowned in the dust of a thousand little zebra-striped mini-buses which flowed like a string of safari ants from one game reserve to another, interrupted only by the sometimes impassable roads, wet with the equatorial rains that can block a road in five minutes.

The man with the rifle is responsible for bringing all of these people to Africa, for he was the man, on foot, who opened up this part of the world, and the way it looks today he might also be the one to end it. Nevertheless, once East and South Africa were safe for the tourist, business really boomed. More people became interested in hunting or simply sightseeing. It became much easier to raise money for research for places such as the Serengeti, due to the movies, books, speeches, and especially to the little old lady in tennis shoes who came to "ooh" and "aah" at what she saw, take pictures with her instamatic and go home to become an instant authority on Africa and what those mean old hunters were doing to the game. At the same time she was probably clutching her hand-made leopard purse and walking around in her crocodile shoes, wearing an elephant hair bracelet and an ivory necklace!

This little old lady in tennis shoes – by now an image among those of us who do hunt – has become the worst enemy of the game animals in the world. There are many millions of people who do not hunt – yet they are the ones who bought all the leopard coats and are still buying the carved ivory,

and unfortunately they don't care whether I hunt or not. They contribute very little, either in time or money to conservation. There are others who constantly claim the hunter is a terrible person, waving a sword dripping with blood from some helpless animal that he has murdered, and they are collecting over \$20 000 000 a year in the United States alone to try and stop the hunters from going into the outdoors. They are not spending that money to save the game though. The hunter in America is paying over \$200 000 000 a year to help our game situation. In 1976 \$142 million was spent on game licences along in the U.S.

Because of the many ways licence fees are used for the benefit of all wildlife, the purchase of a hunting licence, whether by a hunter or non-hunter, is one of the best contributions that can be made today for conservation. This is true whether it be in the United States or Africa or elsewhere in the world. Licence fees pay for the work of the game wardens, the researchers, the game biologists, the game scout, the office clerk, and the general manager or director. If it were not for the hunter and his interest in conservation, there wouldn't be any game at all today in the United States, except in zoos. Tomorrow this may be the same story in Africa.

In East Africa today, and especially Kenya, I have watched the slaughter of the most impressive of all the animals on earth – the African elephant. Greed is the motive for this massacre, which has been led by members of the ruling family of Kenya and it will not stop until they themselves are stopped. At least forty-five thousand elephant have been poached. Now the hunting has been banned there and there are over one hundred and fifty gunbearers who once were poachers and now must poach again if they are to survive, for they have no other means of livelihood. This is the tragedy going on in Kenya. Poaching has increased to such a state, that it is just a wholesale slaughter of anything that moves. Unhappily, to prove that the hunter was the "bad guy" in this poaching, the government of Kenya announced that they were stopping all hunting, as hunters – professional hunters – were the cause of the deaths of all the elephant.

At the very height of hunting in Kenya, no more than 150 elephant were taken on legal safaris by clients in any one year. In all of East Africa, in the early fifties and sixties, no more than 300 elephant were taken on safaris in one year by shooting clients. In the last two years over fifty thousand have been gunned down by commercial poachers under the command of Mrs. Kenyatta and her cohorts, who were either too afraid of not doing as she bid them do, or who wanted a piece of the pie.

Greed, encroachment, destruction of habitat, the population explosion, perhaps all these factors have caused the decrease in the number of animals in Africa – not the hunter, the legal hunter of America, who at one time made up ninety per cent of all the hunters who came to Africa. Today that figure has changed and less than forty per cent of the hunters in Africa today are from the States. At one time forty per cent came from Texas alone. Only ten per cent do so today.

The hunter was the first to encourage young people to experience the world famous Wilderness Leadership School, started in South Africa by Ian

Player. Those first youngsters came from America and Mexico. Many more have followed in the past ten years and many more will come along, hopefully, a long time after I am gone. One of the most wonderful memories I shall ever have are the sights and sounds of the first *indaba* held after the first group of youngsters from America came over here. The sights were the excited faces of the youngsters reflected in the light of the big campfire which was the middle of the circle of the *indaba*; and the sounds were the voices, some soft but becoming stronger as the fear of speaking what was in their hearts disappeared when the sincerity and reality of the people with whom they were sharing those deep thoughts evoked their self assurance and words came tumbling out like water over a small cataract in a mountain stream. Their thoughts were as clear as that water because their words came from their hearts, and I readily reveal that tears were in the eyes of Ian Player, Nick Steele, Dr. T.C. Robertson, Gordon Bailey and all the other wonderful men who were part and soul of the Wilderness Leadership School. No reward I shall ever receive shall be any greater than the words of one youngster who, after the trip came to me as we said goodbye and said: "Thank you for changing my life, thank you for believing in me and thank you most of all for helping me to find myself. I can face anything now." I have shared these words many times with many others who have done far more than I have. That youngster is a successful lawyer today and crowned his education as president of his class. What more of a reward could anyone ask than that?

In Africa, the hunter, the American hunter, has contributed his money, his time and knowledge to conservation in such an amount that it sounds like the national debt of some countries. Game Coin has been involved in over twenty major projects in Africa. The African Wildlife Leadership Foundation received its first money from an American hunter and the board of that organization today is made up mainly of people who have grown to love Africa because they have hunted over there. All of the members of the Shikar-Safari Club International are hunters, and either through that organization or some other organization to which they belong, they have raised a very large sum of money for use in conservation in Africa. The Mzuri Safari Foundation has done the same and they too are all hunters, as are the members of the African Safari Club of New York, Philadelphia and Washington. All of these organizations have sent money to Africa and the members themselves have spent over one hundred million dollars in East and South Africa, all of it for the benefit of the game department and indirectly for the benefit of the game itself. There are many American hunters who are members of the South African Wildlife Society, and many, such as myself, are life members.

The American hunter-conservationist, as much as anyone else – and I would like to hear Robert Ardrey comment on this – is responsible for a new science called ethology, which is the study of the behaviour pattern of animals.

You will probably hear that the hunter is not a conservationist and some may go so far as to say the hunter is just a killer. I will not try to defend myself for being a hunter, for I feel that no defence is necessary. Man was born a hunter and in the days before the modern packing plants he had to hunt in

order to survive. Today his killing is done for him by some person with either a sledge-hammer, a sharp knife, or a small rifle stuck against the side of an animal with a bullet which goes into the brain.

The main reason I have found, why people hate me because I am a hunter is that they are not able to hunt successfully themselves, have never done anything about hunting except watch some television programme slanted to make the hunter look bad; or it just might be that they hate the fact that I enjoy hunting.

The hunter conservationist of America is a person who loves the outdoors. I feel a strong love for the animals that I hunt. I respect them for their beauty, their strength, their ability to hide, and for their ability to also kill me. I am just one of thousands of Americans whose motto is "prevent the end of the game".

The American hunter has put his money up, he will stand up to be counted. The American hunter is basically a quiet person, usually financially independent, conservative in his outlook on either government or politics, and a person whose love of the outdoors is at times hard for even himself to explain. We worship in this great place that for me is my cathedral – the great outdoors. Perhaps I can best explain how I feel in these few words:

The spell of Africa has seized me
And taken me by the hand
To lead me down an elephant's path
and make of this mortal – a man.

Wilderness and the Sea

DR A.E.F. HEYDORN

The term "wilderness" implies the action and interaction of the physical and living forces of nature, unimpeded by the activity of man. This concept applies to the marine environment as much as to that on land. "Wilderness" can be experienced during a storm at sea, in the thrill of surfing, by canoeing up a placid estuary, diving on a coral reef or by descending to the depths of the ocean in a bathyscaphe. Everywhere the interaction of life with the physical environment can be observed in infinite variety. In all this man has his rightful place as long as he does not, through his dominance, disturb the overall equilibrium.

While it is unlikely that man's activities will ever change physical environmental forces such as those involved in generating a storm at sea, his influence is nevertheless profound in virtually all components of the marine environment. Not only can and does he affect the food-producing potential of the sea but also the recreational value of the coastal environment. Thus it is distressing to hear ocean explorers such as Cousteau or Heyerdahl state that the oceans are "dying" as a result of pollution or that the debris of pollution can be seen floating even in the mid-Atlantic. While these statements have been widely criticized as being emotionally based and generalized, the observations of people with such intimate contact with the sea should not be swept aside lightly. Note must also be taken of the plea by the prominent German oceanographer Dr. H. Thiel at the joint Oceanographic Assembly held in Edinburgh in 1977, that the dumping of waste products in deep ocean basins is extremely dangerous because the life inhabiting great depths is so specialized as to be far more sensitive to pollution than that in shallower water, and also because of the constant trophic interaction between the deep water organisms and those inhabiting the water above.

It is clear that man's activity is slowly whittling away the quality of the environment and that he is reducing its food producing potential at a time when his own population is increasing dramatically. As long as this continues, the prognosis for his future is not good.

At a wilderness symposium the danger exists that one is preaching to the converted. Nevertheless one hopes that the message will be spread further afield. To be effective, the message must be easily understandable and succinct. Under the title "Wilderness and the Sea" I therefore want to present only two examples. One is the discovery of a completely untapped rock lobster population on the remote Vema Seamount in the Cape basin of the South Atlantic ocean and the effects within three years of drastic over-exploitation of this resource. The other is the ecological situation resulting from insensitivity in the use of the coastal environment of the province of Natal and the steps which are being taken to correct matters.

Vema Seamount

Simpson and Heydorn (1965)¹ described a multi-disciplinary investigation of this undersea mountain, which took place in November 1964. The Vema Seamount is situated in latitude 31°38'S, longitude 8°20'E, approximately mid-way between the Walvis ridge and the South African mainland. It was discovered in 1959 during cruise sixteen of the Lamont Geological Observatory research vessel *Vema*. The seamount base is approximately 58 km in diameter at ocean floor level (4 500 m) and the overall slope inclination is one in four, or 15°, terminated upwards by a plateau of some 80 km at a depth of 75 m from which the highest peak rises to within 25 m of sea level. The consistent depth of the plateau and the frequent recovery from it of rounded boulders and pebbles suggest strongly that it is a wave-cut platform which probably corresponds to a eustatically lowered sea level during the Pleistocene. Another persistent level, probably also wave-cut, was noted on most traverses at a mean depth of 110 m.

The expedition in 1964 was undertaken under the auspices of the South African National Committee for Oceanographic Research and with the generous assistance of the Marine Diamond Corporation who provided the prospecting vessel *Emerson K* for the purpose. The ship was equipped with special airlift equipment to bring bottom samples of up to 10 cm in diameter to the surface. Furthermore scuba divers carried out direct observations and collected marine life inhabiting the peak. Rock lobsters were collected by divers, and with baited traps.

Using radar fixes from a centrally positioned reflector buoy, bathymetric survey traverses totalling approximately 283 km were run along radial lines at 30° intervals and along a number of tangential lines to fill in detail. The plotted data was used to compile a bathymetric chart and profile of the summit zone.

As an isolated peak in the ocean, reaching within the zone of sunlight penetration but separated from the neighbouring mainland and islands by barriers of depth as well as distance, the Vema Seamount was found to harbour an exceptionally interesting and abundant biological community unaffected by human exploitation.

Collections of sessile benthic fauna and flora were made from depths ranging from 25 to 60 m by scuba divers. The rocky bottom was found to be covered by a prolific and varied growth of sponges, hydroids, ascidians, a large species of holothurian, and seaweeds with abundant kelp (*Ecklonia*). The fresh remains of three small oysters were recovered at one locality. It is of interest to note that the composition of the benthic fauna is not typically South African and appears rather to show zoogeographic affinities with Tristan da Cunha. For example, the rock lobster species *Jasus tristani* was observed in considerable numbers by scuba divers and 111 were recovered for examination. The sample comprised eighty-eight males and twenty-three females with very few juveniles. The closely related *Jasus lalandii* which is prolific on the South African west coast is absent on the seamount. An abun-

dance of fish was observed by scuba divers and confirmed by handline fishing with the following results:

Species	No. caught	Size range (cm)
<i>Seriola lalandi</i>	58	68-122
<i>Acantholatris monodactylus</i>	42	38- 63
<i>Polyprion americanus</i>	3	76-101
<i>Decapterus longimanus</i>	4	25- 30
Unidentified species	3	±25

The similarity to fish from Tristan da Cunha is again striking. No sharks or other *elasmobranchs* were observed (sea surface temperatures varied between 18.3° C and 18.8° C) although many were subsequently reported by commercial fishing boats.

From this brief description it will be clear that, at the time of the 1964 expedition, Vema Seamount was a marine wilderness area in the truest sense of the word. Unfortunately this did not remain so for long as an international fishing fleet converged on the undersea mountain to exploit the small but prolific rock lobster population. These catches were monitored and the results² showed classical symptoms of over-exploitation within two years. These involved a drastic change in the ratio of sexes in the catches made with baited traps (Table 1) and a substantial reduction in the mean size of rock lobsters caught (Table 2). These tables are based on the measurement of 2 152 commercially caught rock lobsters from the seamount.

Table 1
Percentage males and females in commercial catches of rock lobster from Vema Seamount.

Year	% Males	% Females
1964	77,8	22,2
1965	75,3	24,7
1966	25,4	74,6

Table 2
Mean sizes of *J. tristani* in commercial catches of rock lobster.

Year	Mean Carapace Length (cm)		
	Males	Females	Sexes combined
1964	13,1	10,0	12,4
1965	14,2	10,7	13,3
1966	9,7	9,4	9,5

After two years, at the end of 1966, the fishing project collapsed because of minimal catches and high operating overheads. What happened?

Due to the haphazard method of fishing it was impossible to gather catch statistics which would have enabled the estimation of catch per unit effort or fishing mortality, leave alone an assessment of stock size or recruitment rates. However Tables 1 and 2 give a very clear indication of drastic changes in population composition as a result of fishing and the following picture can be reconstructed. Because of the distance from the South African mainland 900 km away where *J. lalandii* is fished commercially and from the mid-Atlantic ridge region where *J. tristani* is exploited at Tristan da Cunha and Gough Island (1 500 km away), there is no possibility of recruitment via adult migration. Recruitment can therefore take place only as a result of larval settlement. In terms of the extended larval life of these animals and the current configurations in the South Atlantic ocean, only larvae originating from the mid-Atlantic ridge can reach Vema Seamount.²

However, even with a massive production of larvae in the mid-Atlantic ridge region, it stands to reason that only a very small percentage could reach a minute spot in the ocean such as Vema Seamount, settle successfully and then grow to maturity. It is highly unlikely that larvae produced by the Vema rock lobster population could remain in the vicinity of the seamount for months until they are ready to settle and assume a benthic mode of existence. Thus self-repopulation can virtually be ruled out. Recruitment must therefore be a very slow process and a small population with a slow recruitment rate is highly vulnerable to exploitation. The collapse of the fishery after only two years is therefore not surprising. At the same time it is of interest to note that many of the fishermen followed the very short-sighted practice of tailing the animals at sea and dumping the cephalothoracic parts overboard. These accumulated on the plateau area on the mountain top, decaying and polluting the fishing grounds.

Man's greed and insensitivity towards the environment had therefore depleted this unexpected protein resource and in the process a true wilderness area was despoiled. On a small scale, Vema Seamount is an example of what happens to the very much larger over-exploited living marine resources occurring on the continental shelf regions of the world. The processes of depletion and pollution may take longer to make their effects felt but the end result is the same. Although slow, stock recovery of the Vema rock lobsters has occurred, as the results of occasional fishing by individual boats on the seamount have shown. On the more accessible continental shelf regions such recovery of stocks can be more difficult.

The coastal environment of Natal

The major features of the Natal coastline are the reasonable straight configuration of the shore, the large numbers of rivers flowing into the sea south of St. Lucia, the absence of rivers to the north of St. Lucia and the major estuarine systems of Durban Bay, Richards Bay, St. Lucia and the Kosi Lake system. The edge of the continental shelf lies fairly close to the present shoreline, about 8-16 km from the coast, except in the region between Richards Bay and Durban where it moves up to 35 km from the coast.

High dunes covered in vegetation border most of this coastline. Between the dunes and the Lebombo mountain range lies the low coastal plain of Zululand which continues southwards as far as Richards Bay and northwards through the greater part of Mozambique. During the Pliocene this plain was submerged and formed part of the continental shelf.

King³ estimates that the Drakensberg plateau reached an uplifted level of about 2 000 m during the Quaternary era (\pm 1 million years ago) and nearly 1 000 m only 80 km inland. The descent of the land from here to the sea is therefore steep and the major rivers flowing from west to east have carved spectacular gorges, all of which rapidly deepen inland. These rivers are therefore still in the process of cutting actively and transporting terrestrial sediment to the sea. The erosion products (augmented vastly in recent times by poor farming techniques) accumulate in estuaries and are eventually washed out to sea.

The Tugela bank to a large extent has been formed by sediments originating from the Tugela River. The same applies to the St. Lucia bank on which is deposited sediment carried to the sea from the Umfolozi catchment area.

A further factor contributing to the geo-ecology of the Natal coast is ocean swell which is not buffered by fringing reefs or a kelp margin and strikes the shore with considerable force. It generates a powerful water movement parallel with the coast, seaward flowing rip currents and associated flows towards the shore.⁴ Swell-induced water movement also has pronounced scouring action resulting in detritus formation through erosion of inter and infra tidal reef life in particular algae. This detritus and associated bacterial fauna represent an important energy input into nearshore food chains.

Very characteristic of the Natal coast is the powerful southward-flowing Agulhas current transporting water of tropical/subtropical origin and the periodic northward movement of water of temperate origin between the Agulhas current and the shore.⁵ Water of temperate origin is particularly noticeable along the Natal coast in winter and it brings with it cool water biotic components ranging from plankton to pelagic fish (e.g. the clupeid, *Sardinops ocellata*), to sea-birds and even marine mammals such as the Cape fur seal, *Arctocephalus pusillus*. In general it can be said that the waters of the Natal coast are exceptionally rich in the variety of species they carry.

Due to the high water run-off from the land into the sea during the summer months, frequently coupled with substantial flood conditions, river mouths and estuaries evolved in such a way as to allow them to cope with great variations in water flow and level. Thus many rivers follow a tortuous route as they approach the sea; the river banks in their natural state are well bound by plant cover ranging from reeds to riverine forests; floodplains and swamps break the force of flood-waters and act as filters; macrophytes consolidate estuary beds; and a natural rhythm of the closing off of river mouths and estuaries to the sea during the dry winter months by sandbars can be observed. When early summer rains raise river levels they break through the sandbars to re-establish a connection with the sea.

Marine and estuarine life is well-adapted to this situation. Organisms, both in the deeper and the nearshore waters, can cope with seasonal variations in temperature, salinity and turbidity while the reproductive cycles of many marine fish, prawns and other organisms are timed in such a way that their juvenile stages find shelter and food in the estuarine environment, grow to sexual maturity and then return to the sea to spawn.⁶

From this brief description of the coastal environment of Natal it is clear that a substantial degree of biological interaction exists between the sea and the estuarine environment and that this interaction has evolved in response to the climatic and geomorphological characteristics of the region. The wilderness concept of "action and interaction of the physical and living forces of nature, unimpeded by activity of man" applied and the coastal environment of Natal as witnessed by the early settlers must have been one of rare beauty and richness. What is the situation now?

The province of Natal has seen phenomenal development. It is the most important sugar-producing region in South Africa with the associated milling and paper and pulp industries. The harbours of Durban and Richards Bay are the largest in southern Africa and have stimulated a tremendous amount of industrial and economic development as well as the construction of rail and road communication networks. The many rivers of Natal provide plentiful water for both agriculture and industry. Smaller towns and resorts have been established on the coast where holiday-makers can frolic in the surf, fish or enjoy the beaches and tranquil estuaries. In short Natal is a thriving and productive part of South Africa, contributing food and export commodities to the overall economy but at the same time it represents one of the most important tourist areas of the country.

Inevitably this extensive use of a coastal environment has led to conflicting interests and ecological problems. While it was difficult to foresee these during the early stages of development, their recognition now and, if possible, the overcoming of a multitude of ecological problems, is not an easy task. Great efforts are being made to find the necessary solutions through improved communication between planners, economists, developers and ecologists and through the co-ordination of provincial and nationally sponsored research involving universities, museums, provincial and private research organizations.

Coastal problems can be summarised as follows:

- (a) While the rivers provide water for agricultural and industrial purposes they also represent a medium for the disposal of effluents. Pollution through industrial waste, insecticides and fertilizers running off from the land or water from domestic sources is causing ecological changes in both rivers and estuaries and is also undesirable in terms of aesthetic and health considerations.
- (b) Agricultural malpractices, particularly as regards the destruction of vegetation binding river and estuary banks (in spite of the clear stipulations of the Soil Conservation Act) cause bank erosion on a substantial scale and silt deposition in rivers and estuaries.
- (c) The importance of floodplains which break the force of flood-waters has

already been mentioned. These floodplains frequently take the form of swamp areas densely vegetated with reeds such as phragmites or papyrus. As flood-waters spread out over these swamps water velocities are reduced and silt is deposited so that the swamps and floodplains act as filters before the water enters the estuaries. The significance of these floodplains and swamp areas has in many cases either been ignored or not appreciated. Thus they have been canalized, for example, the Umfolozi floodplain at St. Lucia, the Umhlatuze floodplain at Richards Bay or the floodplains to the south of Durban where the massive Prospecton industrial area has been developed. The consequences are severe siltation problems (e.g. in both St. Lucia and Richards Bay) and the necessity for diverting rivers directly into the sea. In some places, for example Margate, floodplains have been used for trivial purposes such as the development of go-kart tracks and putt-putt courses. In other areas they have been utilized for sports fields or parade grounds. This means that the majority of the river mouths and estuaries of Natal have lost their aesthetic charm and much of their biological productivity. Pressure is exerted upon the Government by agricultural, municipal and industrial authorities that river flow must be controlled through the construction of dams. However, the treatment of symptoms holds no long-term solution and eventually the non-recognition of the function of floodplains leads to economic disaster in the agricultural field with huge areas of arable land being washed into estuaries and the sea during times of flood, and to severe problems for industry and municipal authorities.

- (d) It is clear that this situation is highly detrimental to the important tourist industry of Natal. Not only will the Natal coastline lose much of its natural beauty if these processes are allowed to continue but the food producing potential as well as recreational and commercial fishing operations will continue with declining trends which are causing concern at present. The reason is that because of the dependence of many marine organisms including angling fishes and prawns upon the estuarine environment during juvenile stages of their life cycle, the degradation of estuaries is also reflected in poorer catches of the adult stages in the sea. Furthermore, heavy metals and other pollutants are shown to accumulate in the flesh of molluscs, crustaceans, teleosts and other marine animals. Recently municipal health authorities sounded the warning that crayfish and mussels caught between Durban and Isipingo should not be used for human food consumption.

From these few examples it is abundantly clear that unless cognizance is taken of the ecological characteristics and sensitivity of a coastal region such as Natal, the economic benefits to be derived from the region cannot be used optimally and may even fall away in the long term. It must be appreciated that it is impossible to build a sound economy on a damaged environment and that it does not help the overall economy of the country if one industry is developed at the expense of another. Apart from these considerations it is a short-sighted policy to allow a reduction in the food producing potential of the coastal waters of Natal to take place at a time when human population

figures are climbing rapidly. It should also not be forgotten that the harassed human being of the twentieth century is in spiritual need of areas unspoilt by his own activity, i.e. wilderness areas, if he is to retain his mental equilibrium, and that wilderness areas are becoming increasingly rare in Natal.

A flight in a light aircraft from Natal to East London along the Transkei coastline reveals a coastal environment in almost wild condition the moment the Umtamvuna River is crossed. Coastal cities and industries do not exist, swamps and floodplains are intact, estuarine waters are clear and biologically productive and the beaches appear untouched by human activity. The coast of Transkei as it is now shows what Natal was like as little as fifty years ago. In fact much of it could still be categorized as true wilderness. The coastal people of Transkei live in ecological balance with their environment. They take food from the intertidal zone at spring low tides, they derive protein from estuaries and rivers but not in such a way as to upset the overall equilibrium.

It is clear that this situation cannot remain as it is indefinitely. Transkei is an independent state and industrial and agricultural development is essential. The Transkei coast has one of the best potentials for a tourist industry in the world. The Government therefore faces a tremendous challenge – to utilize a unique environment for the benefit of its people without destroying what makes it worth developing. The Government is apparently tackling this task with care and foresight through the appointment of an environmental advisory body and the sponsoring of coastal surveys encompassing forests and other coastal vegetation, estuaries and the intertidal zone. On the basis of this information the coast is to be divided into high and low density recreational areas, state forest reserves and conservation and wilderness areas. It is a pity that such a policy could not have been adopted when the development of the coastal regions of Natal began, but the necessary basic information was not available.

Ironically the desire for wilderness areas, where man can form part of an environment without dominating it, is becoming stronger and stronger as it becomes even more difficult to find such environments. It is as though man is reaching out to grab something precious but that it slips through his fingers to be lost forever. Yet man is an adaptable creature and has the remarkable ability to achieve what he sets out to do, irrespective of price. Up to now this price has been high, the most important facet being that it has led to setting in motion processes which are progressively destroying the environment upon which he ultimately depends for his survival.

Thus the need for wilderness areas is more than the longing for wild places – it is the recognition of the simple truth that man cannot survive if he elevates himself to such a position of dominance that he thereby destroys the ecological equilibrium of his environment. The wilderness concept must therefore go further than the setting aside of wilderness or nature conservation areas, be they on land or in the sea. It must encompass recognition of the interaction between climatic, physical and biological factors in the overall environment of which man forms part. It must embrace the willingness to take heed of the information which has become available through scientific

research, recognition of the need for effective communication between scientists, planning authorities and all who are responsible for development and most important of all, the willingness to bring sacrifices in individual fields of endeavour in order to protect and rehabilitate the environment upon which we depend as a whole.

Perhaps the word "willingness" should be replaced with the word "will" – the will to make the sacrifices necessary for our ultimate survival. It must be the will to transcend all considerations which normally preoccupy us to such an extent as to blur our perspectives and sense of priorities. This means that the will to recognize the needs of the environment upon which we are so totally dependent must be strong enough to overcome our political and sociological prejudices. If we, the human race of the twentieth century, are not capable of recognizing this truth, there is the strongest likelihood that the political ills of the world will be overtaken by ecological ones and that in the end nature will restore her own balance without any consideration for the privileged position which we have come to regard as our right.

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Bushman Beliefs: Cultures and Lore

MARTIN XASE

Interpreted by Colonel Laurens van der Post

I am one of a race who at one time inhabited the whole of southern Africa and today, alas, there are only a few of us left. I myself was born at Kunkwe and my name is Xase. I am called Xase because at the time when I was born there was a great sickness among the bushmen people in the desert and we were dying and everybody was at a loss as to what to do, but on the day when I was born the dying stopped miraculously and I was called Xase, meaning he who had brought the right cure to his people. I was one of a family of three and I was brought up, of course, as a boy educated in the traditional means, principally through stories in the manner of my race and one of the first things that I was taught was about a war that we had in the past.

There were two kinds of bushmen in the beginning and this war began in the classical manner – it began over a woman. One lot wanted a very beautiful woman from the other lot and we had a war, and it was a terrible war. One person was killed. As a result of this they called a meeting, and they said, "What terrible people we have become – we have killed, it is not right that people should kill. It is not right that we should meet, because obviously, we are not the right sort of people to meet." So they drew a dividing line across the desert and one of the first things that I had to learn was this dividing line because one half from that day hunted from this dividing line northwards and the other half hunted from the dividing line southwards, and since that day there has been no killing between them. (This border line extends right the way through the Kalahari – the bushmen in the central desert also respect this border line, because they too did not want any more killing.)

The next important thing that I had to learn as a child was how to hunt by watching others hunt and to see how they did it. Of course we hunted with bows and arrows and with a spear. The bow was poisoned and we had three kinds of poison that we used. One was a male poison, the other a female poison and the third was a poison beyond the male and the female. And it all came from a grub which we took out from the root of a certain tree. We pulled off the head of the grub and we rubbed it into behind the head of the arrow; the arrow was made in such a way that the head was detachable on impact. The head went in and the rest of the arrow fell off and there was some desert sisal wrapped around. This poison was rubbed in and then the roots were crushed and this was rubbed in with the inside of this grub which we had taken out from the roots and this made a formidable poison. At the age of about fourteen I was at last allowed to go on a hunt by myself, not just to accompany it. I was given a bow, a quiver full of arrows and a spear and I went out with my father and brother. We were very hungry and went out on

the hunt and we walked. The three of us, my father, my elder brother and myself, walked for two days. And at the end of the two days we suddenly came across the spoor of some buffalo. We followed the spoor and there we saw the buffalo grazing among some acacia trees. My father went ahead and we stalked the buffalo and my father shot one of the poisoned arrows in the behind of a buffalo and all the buffalo went off and then, this is after two days, we camped for the night and early the next morning we got up and followed the spoor of the wounded buffalo because we knew, shot in the back, the poison would take some time before it took effect on the buffalo. At last we caught up with the buffalo. The buffalo was lying under a tree pretending to be dead, but we knew that the buffalo is not only very powerful, but one of the most cunning animals on earth, so we did not show ourselves but watched the buffalo and saw an ear moving. To make certain we were right, we felt around and picked up some stones and we threw these stones at the buffalo and immediately the buffalo stood up and my father and brother and I took out our arrows as fast as possible and shot them into the buffalo. Unfortunately these arrows did not have much effect because the ribs of the buffalo tend to be very flat and the skin is very thick and the arrows just bounced off the buffalo and made the buffalo very angry and the buffalo came charging straight down at us and we started to run away. We took off, my brother and I ran for the nearest tree and my father, in order to draw the buffalo away from us, ran straight – straight as you could make it and then we saw to our horror that the buffalo was catching up with our father and my brother immediately took courage and went after the buffalo and there to my horror I saw the buffalo chasing my father and my brother chasing the buffalo. I took off after my brother. The buffalo caught up with my father and threw him, giving him a very bad gash with his horn and knocking him down. My brother went in behind the buffalo stabbing as fast as he could and I then joined in. I was no longer frightened as I was afraid for my father, also stabbing as fast as I could. We killed the buffalo. But we saw that our father was terribly wounded. We saw our father's lung protruding through his chest and we patted it back and tipped him up to let the blood flow away so as not to mix with the lungs. We had some sort of cloth material around us which we tore in strips and we tied this around the wound and took our father into the shade of a tree and we then made a kind of a stretcher and we started to carry our father back towards home. It was very hot and our home was far away. We walked for nearly twenty-four hours. We had no water so we dug out a certain kind of tuber which, when cut into slices, produces a bitter white liquid which is very good for the thirst. We gave a lot of this drink to my father and at last, exhausted and worn out and my father very ill, we arrived home. There we were, miles away from anywhere, we never saw any motor cars and we were wondering what to do when suddenly we heard the sound of a motor car. We rushed out and brought the people in, they were white people and felt sorry for us. They looked at my father and said, "We can't do anything for him here, he will die. You have all got to come with us." Myself and my brother and the whole family went and took my father to the hospital, which is a long way because we lived near Kunkwe, which is

between Grootfontein and Gobabis. We took my father to the hospital in Gobabis where it took him two months to recover. And that was my first hunt.

I was then taught about the importance of dreams. I myself had a dream, I believe in dreams, we all believed in dreams and I still believe in dreams. I had this dream in which I went and shot a warthog, *vlakvark* as they say in Afrikaans, with a poisoned arrow and killed it. I had never done such a thing before. Although my friends laughed at me and I showed them the arrow, two days later I saw the warthog and shot it with this very arrow. But there was a more important dream which was told to Mr. Marshall, of the Marshall expedition and which is properly recorded. This was a very important dream because it was dreamt by a man who was dying. And this man didn't know what to do, and his family didn't know what to do, and then a dream came to him in which he was visited by his forefathers. And the forefathers said to him, "Listen carefully to this song that we are going to sing and when you wake up, just sing this song and the music will cure you." He woke up the next day and he sang this song and immediately death was driven away and he became a healthy person again. Unfortunately I cannot sing this song, only the old people can sing it. But I wish that I could sing it.

In the beginning of the people of the earlier race, a period of bushman history when all the animals and all the human beings were one, the stars and the moon were one and there were no divisions, the moon looked and saw the people were frightened of dying. The moon took pity on the people and thought it would send mankind a message and it sent for the fastest animal it knew, it sent for the hare. The hare came and the moon said to the hare, "I want you to run, and go to the people on earth and tell them they must look at me and see that as I in dying am renewed again so they in dying will also be renewed again." The hare like all things in a hurry got the message wrong and it ran and got to the people on earth and said, "Unlike the moon who in dying is renewed again, you in dying will not be renewed again," and the moon was so angry with the hare for getting a vital message of fundamental truth so wrong that it hit the hare on the lip and that is why the lip of the hare is split to this day, because he bore false testimony on a matter of vital importance.

And from that day when the moon in anger hit the hare on the lip the people who know this story, the people in the traditional way of burying a bushman, they bury him with his face to the east, because that is the place not only where the new day rises but also where the moon of renewals comes up. And that is all that I have to say to you today, and I will just add that I hope that this story and this light contribution will help the moon and you all on the way.

Conservation and Newspapers

DONALD R. MORRIS

I am not a conservationist. I would like to give what support I can and I come to you and talk as a newsman.

I spent 17 years in active operations against the Soviet intelligence services, finally retired, and was stunned to find that practically the entire world had been raised on James Bond novels and movies, and was willing to believe absolutely anything whatsoever about an intelligence organization. I have now been working for a newspaper for five years and I find that there are radical misconceptions about newspapers held by the entire public and by large sections of the working press. I doubt seriously if I would ever be able to disentangle any of these misconceptions, but I would like to talk a little about newspapers and what puts them together, because we're all here to aid a worthy cause, and worthy causes will not move very far without publicity and publicity means, among other media, newspapers.

Now, what is a newspaper? It is not the front page you see every day, or the sports page. It's a working, living organism and it has five or six parts to it. The most important part is the owner. Now owners like to call themselves publishers, it sounds fancy. They have very little to do with running the newspapers and nobody in the newspaper will refer to them as editors, so they're simply called the publishers. But it is an entity that is owned, that has money invested in it and must return a profit. A newspaper is first and foremost a commercial enterprise. This must never be forgotten. If it is not successful as a commercial enterprise it goes out of business. The reporters cannot be paid, nobody else can be paid. It has to make money. It makes money from advertising, not from the money you pay for the newspaper in the morning. That hardly covers the cost of circulation. It is advertising. That is what a newspaper is there for, not to carry your news but to carry your advertising. If the newspaper is successful, if people buy it, you will get ads. The most important figure in the newspaper is the number of people to whom the ad is exposed per dollar. Now that means that the ads control the newspaper. I have carte blanche to say anything whatsoever in a column I write four times a week as long as I don't attack the advertisers. I have to stay off real estate first and foremost, because that's where most of the advertising comes from. I have to stay off used car dealers, I can't say anything about department stores, I can't talk about zoning. I say anything I want to politically, we're a free press. I've had three columns spiked, two were about real estate and one was about used cars.

This is true of everything that goes into that newspaper. You as the public have enormous protection in most countries in the world against political outrage. You have absolutely none against commercial outrage. You can be

ripped off six ways from Sunday. There is protection but don't look for it in your newspapers. Look for it elsewhere, there are other ways to do it. Now the advertising department is a large one, it controls what goes on in that newspaper. If it's in trouble the reporters are not going to be paid and they will go away. They're not paid very much anyway, but they at least come in for work in the morning, with the salaries that are provided.

There is then the editorial department. Now if the owner has anything to say he will talk to the editorial writers. The editorial writers are a very small and over-worked group and they usually meet in the morning at ten o'clock and decide what they're going to say the next morning and the leader is then written, perhaps a couple of others. If you don't have an editorial standpoint you are not a newspaper. Now for some people editorials are quite important. Unfortunately, we feel that something on the order of 3 per cent of the people who buy a newspaper read the editorials. Generally you're preaching to the converted. If people don't like the editorials in the newspaper they are not going to subscribe to the newspaper in the first place. Occasionally you'll touch off a few sparks but by and large the editorial writing is a fairly safe proposition. If you want to you can thunder, you can inveigh. If you do you'll paint yourself in a corner. In six weeks you won't be able to say anything, because you've taken a positive stand on every issue in sight and no matter what happens, you're stuck.

Now that takes care of the owner, the ads, and the editorials. This leaves the reporters. The reporters are supposed to put together what goes in the newspaper. And the odd thing is that about ninety per cent of what you're looking at in your morning newspaper is not written in that newspaper. It comes in a syndicated form from wire services of every description. What comes into a newspaper is voluminous. Perhaps ten per cent of what comes in gets printed and that ten per cent is about ninety per cent of what's in the newspaper. The comic strips, the movie ads, most of the columnists who are syndicated, a lot of the sports material, advice to the lovelorn – you name it, it comes in. The newspaper can be put out even if the reporters do go home.

Now what on earth do the reporters do? They're generally young, they're overworked, they're underpaid. In most cities they cover the local news. They are the troops that are sent out to get the story if something happens. If you live in Yuhopeitsville and there is a fire in downtown Yuhopeitsville it is going to have to be covered by somebody from the Yuhopeitsville Daily Blaze. Obviously if there is an explosion in Belfast you can't expect a newspaper in the middle of nowhere to have a reporter there. If you're going to hear about it it's going to come over the wire service. So the reporters – and really this means the newspapers – they're covering the local city, the local news. If it's a good newspaper it knows the city intimately. For national news, most newspapers will have one or more men in the capital. Overseas, most newspapers are at the total mercy of the wire services.

I live in a city of two million people, it's the fifth largest city in the United States. The newspaper is one of two papers in town, the only morning paper. It has a circulation pushing of nearly 400 thousand, which is one and a half times as large as any newspaper in South Africa. It is a very good news-

paper, it covers the local scene gorgeously. With the exception of a Hungarian photographer there isn't a single man on that newspaper who has ever lived overseas. What comes in, comes in over the wire services and has to be clipped and eked out by columnists. Now, everybody is upset by what gets clipped and put on the front page. They don't like the coverage. To be upset is quite understandable. Unfortunately there is very little that can be done about that. What goes on the front page is what is actually the news. And the news is determined not by the editors, but by the people who buy the paper. This is what they want to hear, this is what is news to them. There are fifteen hundred newspapers in the United States. It is absolutely incredible: if you got a copy of every one of them and took the hundred lead stories of the week they would be in almost exactly the same order and played in exactly the same way.

Now the reporters very rarely go out to get your foreign news. Of course we have people overseas just as you do, who are supposed to get the interviews and bring them in. Most of them are pretty good or they wouldn't be there.

A reporter is a generalist. He is a very intelligent person and he knows a little bit about everything. But there are very few things he knows in depth and 90 per cent of the time when he is sent out to get a story he is talking to somebody who has been in the business forty years. The reporter doesn't know what questions to ask and the person he's talking to doesn't know how to start explaining it to him. The chance of a really meaningful communication developing is practically nil. Now over the years most reporters tend to develop a speciality in one subject or another. Somebody finds he has been sent out to cover aviation stories very often. He doesn't know much about it, he starts looking into it, he might get a licence. Sooner or later he is known as the man who knows something about flying. If there's a story on aviation the paper will probably send him out to cover it. Forty years later he writes a book about it, he is a leading authority and an expert on that particular field, whatever it is. Now that roughly is how a newspaper is put together.

Why am I discussing this? Because you are here in aid of a worthy cause: conservation. It's a very important cause. Looked at from the side of a newspaper, however, it is one of about six thousand worthy causes, all of which come tramping in the front door and cannot quite understand why their worthy cause is not going to take over half the front page of the newspaper the following morning. It is very difficult indeed. How do we go about getting a newspaper to give some kind of coverage? Writing a letter does no good whatsoever, and the Lord forbid that a mimeographed release of some material should – this isn't even opened. There are lobbyists with distinctive little cachets on the envelopes who mail things to newspapers once a week. Save the postage. It isn't even opened. A personal visit will do slightly better. Now if you happen to know a publisher, you're in. The publisher doesn't do much about the newspaper but once in a blue moon he descends into the city room and says, "I am interested in this." And lo and behold, there is quite likely to be a story about it on the front page the following morning. So if you know somebody who publishes a newspaper, stay with him, you're going to

get publicity. Getting it through the reporters is a little more difficult. If you come to the newspaper in person you're quite liable to find a reporter. You may have half an hour with him. He will listen to you very sympathetically but you may or may not get any coverage. There may be a paragraph in events of the week: "The Whichit Protection Society is meeting Friday afternoon at two o'clock." This isn't going to help very much. Your best bet in a newspaper is to capture and bribe a reporter. Now I am not talking about passing him cheques under the table, but scratch his back. Make him the expert on your worthy cause. Start when he is young, invite him to your congress, feed him – most of them are not fed very well. If you can send him to a conference overseas on what is usually known as a freebee or a junket, do so. He will be honour bound to provide at least a minimal coverage of it. If you feed him this material, if you make him a part of your plans, in five or ten years it is quite possible that he may actually know something about what you're trying to do, so that when there is a story you can pass it on.

You see the trouble with this congress is that for all the work that's gone into it, for all the worthy cause it represents, for all we're trying to do, on a city desk it is not news. It's a depressing fact of life but there it is. It's the old story, man bites dog, that is news. And it very rarely happens in worthy causes.

There are probably fifty congresses meeting for worthy causes, all of them as worthy as this one, and all of them with distinguished guests. And from the outside, for people who are not concerned with conservation, one of those causes looks very much like another cause. And to a newspaper it looks especially like any one of a number of worthy causes. Far and away the best form for us is our own newsletter, our own magazine. The periodical press as a matter of fact is even better. Television is magnificent and when films are produced, we get our publicity there. In a newspaper, about the best way in is to buy a full page advertisement.

Wild Lore of Zululand

MAGQUBU NTOMBELA
Interpreted by Maurice Mackenzie

I greet you all and all those who have come from afar to see this land of mine. I am Magqubu Ntombela, and my father was Makhosini Ntombela. He was in Ceteswayo's regiment and he fought at the battle of Isandhlawana where we defeated the British. My great-grandfather was in military service with Senzangakona and then with King Tshaka and then also with King Dingane. I speak Zulu so listen well.

Zululand is a country of great beauty and we Zulus have our own descriptions for the months and the seasons. We know the animals, the birds, the trees and the plants. They have always been part of our life.

I will begin my talk with the month of October, *uzibandlela*. It is the month when spring breaks and it is named *uzibandlela* because it is the time that the footpaths of Zululand become covered with new grass. It is also the month when the red flower of the *msinsi* (*Erythrina caffra*) falls, and the green leaves of that tree appear. As you can see it is the erythrina leaf that is the symbol of the Wilderness Leadership School and of this World Wilderness Congress.

There are other trees which also come to life, such as the sycamore fig which grows along the banks of our rivers. Animals love the fruit of this tree. The baboons climb up to the very top and in their haste to feed themselves they spill many figs onto the ground. Other animals like the bushbuck, rhinoceros, warthog, grey duiker and inyala will then feed on the fallen fruit. When the baboons have had their fill they play and start trouble amongst themselves. Youngsters tease the older animals who then chase them about the tree, asking, "What do you think you're doing?" and the youngsters will reply, "Sorry, father! Sorry!" "What do you think you are doing?" the older baboon will repeat, and the youngster will say, "Please, father, please." But the older baboon will then hurl the youngster out of the tree by his tail. This will annoy the mother of the young baboon and she will say, "Hey! Hey you! You want to kill my child? What do you think you're doing?" The troop leader, reclining right at the top of the tree, having watched this inter-play, makes screeching loud noises.

Uzibandlela is the month when the owls call most. One that calls frequently is *mabengwana*. The husband calls his wife saying, "Come, come with a pillow." She replies after several invitations, "I'm coming." Always he calls for her and she does not come.

The month of December is named *umasingana* as it is the time of the year when the pumpkins ripen and the women go in search of this vegetable under the hills. It is the month when the blue wildebeest and the impala drop their young. This month dries out everything and is usually without rain. It is so hot and dry that the umbilical cords on the young calves dry out.

It is in *umasingana* when the lion is most vocal. Toward evening he can be heard roaring along the banks of the Umfolozi River. When the lion roars all the antelope get frightened and stay in fear. You can follow where the lions are moving on their hunts by listening to the other animals calling out in alarm, like the bushbuck which barks, the zebra which snorts and the reedbuck which whistles through its nose.

Nhlangula is the month of May, the month when winter starts, when the leaves fall and we feel the first pinch of cold. The days grow shorter and a great stillness falls upon the land. *Nhlangula* is the time when my people begin burning grass on the hills and pastures and it is this month when the *insingizi*, the ground hornbill, begins calling while walking across the burnt grass in search of grasshoppers. As they go one says, "What tree? What tree? What tree is that?" And the other bird will turn round and say, "That tree, that tree, that tree is an *msinsi*." Then after having eaten well one will say, "Have you had your fill? Have you had your fill? Have you had your fill?" And the other will reply, "Yes I've had my fill, I've had my fill, I've had my fill."

It is in this month of May that the *mpafa* tree (buffalo thorn) matures. The leaves change colour to a deep gold-red, fall and give way to the fruit which will be eaten by baboons, monkeys, warthogs, kudu, and black rhinoceros. The black rhinoceros, in order to get the fruit, will place the tree under his chest and foreleg and by exerting pressure will push the tree over, then he will eat the fruit, branches and thorns. Having eaten he will leave the *mpafa* tree and when some distance away will dung. Then he will turn round and destroy this dung, and have a fight with it, and he will scatter it far and wide.

This is the time in the month of May when the impala starts to mate. When the impala mates it makes a snorting noise, and the males chase each other and fight. It is also the month of mating for the wildebeest, and the young wildebeest call when they follow their mothers who are being chased by the males.

In this month of May, when the silence is upon us, you can hear the bird we call the *inkwamazane*, the emerald spotted wood dove. It calls out in grief because the genet cats have climbed up to the nest and when the female returns the eggs or chicks have gone. The bird then sits on its empty nest and cries out, saying, "I gave birth to my children and they're taken, I gave birth to my children and they're taken. I hear my heart say du, du, du du du."

That is all I have time to talk to you about today. I give thanks and request of God that the work of wilderness conservation moves forward and grows stronger in order that all nature be conserved and that we will continue to work with nature for the sake of our children's children. Ian Player, with us, conserved these animals for the people. I give thanks for Ian Player's work in conserving these animals, such as the capture and handling of the white rhino, a feat which in my many years of service in the game reserve I had never before witnessed. Thank you all and may God bless this congress.

Tomorrow Could be an Exciting Dawn

STEWART L. UDALL

Robert Ardrey reminded us many years ago that it all began in Africa and therefore, is it not appropriate in this setting to discuss the future? Conservationists are often put on the defensive in my own country and I am sure in yours. By statements such as that we care more about wildlife than people, that we are more concerned about things which are called amenities than the real things – in fact, that our concerns are peripheral. I don't propose to get on the defensive, I never do. As a matter of fact, the issue that we are here to discuss today is the central issue. The real world is not when one takes the long view, and I am going to ask you to take the long view this morning.

The real world is not the world of the stock market and the supersonic transport, nuclear power plants and things of that kind. The real question that humankind faces today, has always faced and will always face, is a question of whether the things that we do now obliterate and make impossible the kind of future that we could have. I liked that poetic speech by my new friend, Laurens van der Post, who referred to the contract that each generation has – that all of us have as individuals – with regard to the natural world. I would like to think of it in an even broader sense. I think we have a contract with our children and the future. Perhaps some of the press people do not understand this when we talk about wilderness and wildlife or these other values.

It is not simply amenities or part of the natural world. We are talking in the widest sense. It is the relationship of human beings in human activities, and the resources of this small and shrinking planet. I chose as a theme something a great American conservationist, Aldo Leopold, said 30 years ago. He believed that we abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong we may begin to use it with love and respect. Henry David Thoreau, another American writer, said much earlier, well over a century ago: "In wildness is the preservation of the world." What I think he meant was that unless we preserve the natural world, unless the policies that we pursue in our acts and in our programmes are in harmony with nature's laws, the world will not be preserved.

I want to discuss the big picture and the historical trends of our time. I am going to ask you to stand back – because we do this too seldom – and take a long look. I am going to have to move very rapidly, and with broad strokes. What I want to talk about is something that I believe to be vital in terms of our understanding where we are and where we're going. And I don't say this with any dogmatism and I can't present scientific proof that my conclusions are correct, but I suggest to you that we are living not only in, as we always

say, a fast-moving and a complex world. I suggest we may be at a transition point, at a great watershed of history. This is my hunch and I am going to talk about some of my hunches and guesses. Because I believe that the force of a set of waves that have been moving for some time, that have been decisive in man's activities on this planet, has reached a crest, and these waves are being spent and new waves are coming to shore. And I say this after having for the last seventeen years been heavily involved in the energy problem as we now call it, in technological projects of various kinds, and so this is what I want to discuss.

These turning points of history, whether we perceive them in progress or later in retrospect, fascinate us always. The thesis of my presentation is that an historic transition is under way and will dominate human affairs for at least the next half century. This transition marks the gradual winding down of the great technological energy-intensive civilization which has come to a climax in our lifetime and a beginning of a post-petroleum civilization which will be built around more modest technology, and a much more efficient energy system destined to be the permanent energy system of this planet. The corollary of my thesis is that this transition offers fresh hope for ecological sanity and for all the values discussed at the World Wilderness Congress. This paper is based on three main hypotheses, each of them very conservative. I am becoming quite conservative in my views of the world in my middle years. The first of these hypotheses is that the period we are living in probably deserves to be called the petroleum age.

We're going to find out in the next 5 or 10 years just how important petroleum is. I believe it is the most precious, irreplaceable resource on this planet. Yes, more precious than gold. We're just about to find out. Watch it closely – petroleum is not only the most precious mineral resource, it is non-renewable and there are not and there will never be any meaningful substitutes for oil and natural gas. There's been a lot of shallow talk by scientists and by others in recent years about substitutes for oil. I've been saying for 5 years that I don't see any yet, and if there are none, then we shall find out very soon how important oil is. As a consequence, the petroleum age, if that's what we've been living through the last 30 or 40 years, will stand in history as a singular period when very cheap liquid and gaseous forms of energy were for a brief interval available for human use.

My second hypothesis is that the period since the end of World War 2 has witnessed an explosion of confidence in the capacity of science and technology to achieve assorted miracles, as we have called them. Splitting the atom, going to the moon, building supersonic transport, all of these things have produced what we, some of us, are now calling a technological optimism, which has led us to believe that the resources of the earth are unlimited, that energy generated from the atom would be so cheap that we could manufacture and synthesize water and food and minerals. As I look back at my years in the United States government in the 1960s, what some of the scientists were telling me is that resources were not important anymore, that conservation was not important, that we now had such great power with science and technology that we could manhandle the natural world and

create and synthesize resources. And that, unfortunately, is what most people still believe today. In our lifetime this faith in what I call "super technology" and unlimited resources has caused most inhabitants of the world to abandon traditional concepts of earth's stewardship. These hypotheses I am stating are interrelated, and the cheap petroleum and this technological optimism also combined in our thinking to cause humanity to misjudge the carrying capacity of the planet. And if science could expand resources, as we thought, then we could entertain the belief, as we have, that further doublings of the world population could occur without producing famines or unmanageable ecological crises. And the attitude became strongly fixed in our minds that growth was good, and any growth or any expansion was something which could be accommodated in the system and that we could handle it.

An enormous arrogance has developed in the last 30 years. It has dominated our thinking and we're about to pay the price for it. I shall suggest some conclusions as a result of these hypotheses – if my hypotheses are correct. Let me rattle them off quickly. It is probable, for example, that per capita energy consumption is near its peak and will soon begin to decline. It is likely that the high cost of the transitional substitutes for petroleum, whether they are called nuclear, solar, geothermal power or wind, will produce drastic changes in energy uses and in individual and national lifestyles and goals. Our tomorrows will be far different from what we had envisaged. It's also foreseeable that there will be a gradual scaling down, not scaling up, in the sizes of machines and buildings and engineering projects. It is also foreseeable that energy economics will discourage capital intensive big technological solutions. Mr de Rothschild, I believe, is on the right track in talking about small hydro and small-scale projects. As the limits of technology become more obvious, it is plausible that ecological considerations should play a predominant role, as they should in the future, and the recycling and the conservation of all renewable resources will be once again a paramount concern of individuals and governments. In turn, these developments will, one might guess, enhance the general understanding of the values of the natural system which supports existence on this planet, and force everyone to recognize the importance of working in harmony with that system. In other words, from now on, unless I am mistaken, ecology is the central science which we must use as a tool to understand and design all our activities. Another conclusion is that, whatever we think today, population increases will very soon be universally perceived to be a major obstacle to human betterment.

If most of these conclusions are sound, what does the coming transition portend for the cause of environmental protection? Will such trends be good or bad news for wilderness, for wild things, for natural values, for man's struggle to find some way of living in harmony with the natural world? I am convinced, as you may have already surmised, that these changes augur a renaissance for conservation – which should give ecologists a much better chance to prevail in the struggle to preserve whole ecosystems and the health of the biosphere of this planet. These trends should also alter the attitudes

which have encouraged reckless exploitation and brought some regions and river valleys and areas to the edge of irreversible destruction. If the fade-out of cheap petroleum and the growing awareness of the limits of technology forces us to re-define progress and to abandon what in the United States some of us are calling the "Apollo complex", the idea that technology can do everything (which has led mankind to conclude that nature's support system could be manhandled with impunity) then potential overshoots can be avoided, and there will be a chance for transition, which will offer a fresh opportunity for the next generation to adapt and change and create this new and different, and I hope better, world. Well, that's my thesis. Looking at my own country – because in many ways the United States will be the front end – we are on our way and exercising no restraint to becoming the first major oil have not nation in the world. We have done nothing despite the warnings of 4 years ago. We have done nothing essentially to cope with our energy problem, except increase our imports of petroleum. The USA is probably two or three years away from gasoline rationing, allocation of fuels and other major problems.

Other countries may be more or less fortunate when it comes to oil. But I suggest to you: watch oil, watch the consumption figures, because this is a critical arena in the beginning of this transition. I would also suggest that you take a fresh look, and look with scepticism, at the proposals put forward by those who offer new technological solutions. In the USA we have marvellous resources on paper, we have more coal than any other country; we have trillions of barrels of oil-shale, but you must have water to develop oil from oil-shale, or to gassify coal. And we're back to ecology. Water, my friends, is the limiting resource and the crucial resource. We're back to ecology. We always come back no matter what we talk about or what big plans are put forward. We come back to things like water and ecological principles.

And as we move out of this cheap energy period I saw the figures on South Africa, and this might serve as a model for some other countries. Again there are the old trend projections. The population is going to double in the next 22 or 24 years. And so we go along assuming that somehow we will accommodate such increases. But if we are to even hope to maintain the standard of living, we must have much more equitable distribution of what we do have. Can you double gold production, double agricultural production, double sugar production, increase water supplies twice in South Africa? In the next 20 years if the population is doubling, this is the big problem. Wilderness and wildlife are the indicators that give us clues to the larger ecological picture. I sometimes think that we may see this as a kind of golden age – well, not all that golden – but certainly a period which will not be repeated. We have thought it was a beginning and it is a climax. If we begin now, if we take the ideas and concepts and values that are worth discussing and if we put aside some of the arrogant ideas that have crept into our thinking in the recent past, we can build a better world where we are less mobile but more thrifty and more efficient. And maybe it will be a world in which we care more about our own backyard, our own neighbourhood, our own neighbours, our own community, our own river, our own region, than we

have in the past. This is the challenge. Tomorrow at least, I believe, need not be a twilight. It could be a very exciting dawn.

Service and Adventure in Wild Places as Part of The Duke of Edinburgh's Award

COMMANDER L.E. PEYTON JONES

Wild country areas are essentially valuable and important as places where people of all ages can pause to reflect and reappraise both past achievements and future aspirations. Even the slenderest acquaintance with such regions can induce a new sense of values that transforms attitudes, ambitions, and priorities in a most remarkable way, and provides a new, more valid yardstick against which each individual can measure his contribution to society.

For people of more mature years, wild areas are always places of refreshment and renewal, a welcome contrast to the stress and strains of everyday life, but for the young they are places of wonder, adventure, and discovery – discovery not only in the sense of exploration, but also discovery of themselves. It is by exposure to such experience that young people, often for the first time, are able to come to terms with their place in the world, and find new resolve, new purpose and new pleasure in their lives.

The challenge of the natural environment finds an immediate response in the hearts of young people, who quickly appreciate the need to accept its hardships and disciplines as a price willingly paid for enjoyment of its inspiration and beauty. The urge to explore, the determination to overcome instinctive fear of the unknown, and the quest for knowledge are all factors which contribute to this exhilarating renewal of the spirit, so uniquely engendered by experience of living close to nature.

To voice such convictions, or to speak of them from one's own experience may provide yet another excellent reason for the need for regional conservation. For this to be valid, such areas must become freely available to those whom they are designed to benefit – not just to the privileged few, but to the great mass of young people dwelling in the urban areas of all our countries, who stand to gain so much from an introduction to the strange and stimulating countryside.

And here, of course, lies the difficulty – how to make provision for free and frequent access without in the process destroying the very environment which provides the whole purpose of the visit. The answer must surely lie in the question of concentration. Areas of a certain size can absorb only a certain number of people, and this underlines the need to create as many designated recreational areas as possible, ranging from those of the size and grandeur of the wilderness areas, which have been, or could be established on this continent, to much smaller and less pretentious areas within reasonable reach of the main centres of population around the world. A task of undoubted difficulty, but one which will not get any easier as the years go by, and the opportunities for the preservation of such facilities diminish.

Having discussed what the environment can do for man, it would now seem appropriate to consider what man can do for the environment – which is of course a lot.

As well as the continuing need to campaign for public support and political commitment there are many practical measures which should be taken to develop the full potential of wild regions as they become available for use in the way I have envisaged.

These will, of course, include action to conserve existing flora and fauna, as well as possibly introducing new species. But they will also include administrative action to provide information and publicity, to designate trails and camp sites, and to create the minimum facilities needed to ensure the safe and proper conduct of visiting groups.

Where do young people stand when it comes to help of this nature? One clear answer which emerged from the group studying this very problem at a recent five day conference in London attended by about 2 000 young people was as follows:

“Five main problem areas in the environment can be distinguished – a rising population; a dwindling food supply; the exhaustion of natural resources; the squandering of energy; and increasing pollution. Deterioration of the environment must be stopped.

“We can help to achieve this by practical example, public protest and the education of those who are not as concerned about the future of the earth as they might be. Young people must cease to follow the example of the majority of older people; the responsibility rests with the individual; self-sacrifice is the first step to reform. Ignorance, blindness and apathy must be conquered; action is essential now . . .”

I quote from another part of the report:

“The most frightening aspect of the environmental problem is our apparent inability to really join together in a determined effort to solve it. This may be a result of our twentieth century moral blindness or of our slow-mindedness, or of political inertia. But we must act now and overcome these problems. And action must begin with every individual deciding that he or she does not want to live in this destructive society, and is prepared to do something, to join others in doing something, about creating a better world in which to live.”

Such views demonstrate the idealism of youth, expressed in disillusioned rejection of short-term expediency and a burning desire to promote more imaginative ideas. The will is undoubtedly there on a wide international front, and it becomes only a question of directing this tide of youthful enterprise and enthusiasm into the most productive channels.

One way of doing this is through the Duke of Edinburgh's Award Programme, whose purpose is to expose young people to a variety of different experiences which will help them to find their place and play their part, within their family, within their community, and within their nation. Our patron and chairman is H.R.H. Prince Philip, whose personal commitment to wildlife conservation and protection of the environment over many years is well known.

The scheme has also its own special contribution to make towards bridg-

ing social and racial divisions, encouraging co-operation and partnership between different organizations, and promoting a spirit of international friendship and understanding. It can provide the means whereby the resources of governments, the initiative of voluntary organizations, and the enthusiasm of individuals can be combined in most effective fashion to create the opportunities which are so badly needed and yet so vainly sought, by so many young people throughout the world today.

Prince Philip has described the scheme "a do-it-yourself kit for education in the art of civilized living" and sees its programme "as an opportunity for discovery by experience of the oldest truths in human civilization."

The award scheme is not a membership organization but a programme of activities available to schools, youth organizations, business firms, and community groups of all kinds, in fact to any agency having a care and concern for young people between the ages of fourteen and twenty-five. It is meant to complement, reinforce, and extend existing programmes – not to rival or to replace them in any way.

More specifically, the programme requires participants, both boys and girls, to undertake some form of service to the community, to carry out some form of exploration or journey of discovery, to take up some form of hobby or leisure-time interest, to attain certain standards of physical fitness, and to develop home-making skills.

There is a wide choice of activities within each of these sections, and young people are encouraged to choose those which match their own particular tastes and aptitudes and which are of value to their home communities.

The programme is structured at three levels, bronze, silver and gold, to match the growing maturity of young people in the relevant age groups, and these awards require respectively six, twelve and eighteen months to complete. Participation is, of course, entirely voluntary, and there is no element of competition. Young people compete only against themselves, so the awards are within the reach of the less gifted, as well as the more talented members of society. But to gain an award, which takes the form of a badge and certificate, all participants will require qualities of self-discipline, perseverance, enterprise and effort.

In short, the award scheme is designed to offer a balanced and flexible programme of activities which can be adapted to suit the needs of young people from many different backgrounds and environments. It provides a useful incentive to constructive endeavour and a means to promote self-help and self-reliance.

How then can this programme be interpreted in the context of our present consideration of the environment in general and of wild country areas in particular?

There is the obvious need for wild country areas in which to undertake the type of adventurous journey that is required at the highest level of the award. The rigorous training required before such expeditions are undertaken should ensure that groups of award participants do not create the difficulties sometimes associated with less well planned ventures in remote

regions. Very much the opposite in fact, and by being introduced to such areas at an impressionable age, young people gain first-hand knowledge of the problems related to public usage, and are thus all the better qualified to become the future guardians of our heritage.

Another strong link which can be forged between award participants and those concerned with preservation of wild and plant life, is by way of studies related to any of the wide range of natural history topics which can be followed as a leisure-time interest. It could be botany or zoology; ornithology or entomology. Here is a way in which adults with knowledge and experience can help young people to understand the needs of conservation, and awaken their interest in it.

But perhaps most significant of all is the way in which, in the service section of the award programme, young people can undertake a wide variety of practical tasks associated with the protection of the environment in all its forms. Such enterprises as collecting litter, cleaning canals, cutting tracks through the bush, or surveying plant life are attractive to young people, whose commitment to this type of work often lasts far beyond the requirements of the award.

There is thus every reason for close and continuing liaison between national and regional award authorities around the world and their respective groups of environmentalists. Each has much to offer to the other, especially at local community level where ideas are translated into action.

The scheme, founded by the Duke of Edinburgh twenty-one years ago, is now operating in more than forty countries round the world, often under its original title of the Duke of Edinburgh's Award, but also under a variety of others, such as the President's Award or the Head of State Award. Each country is responsible for running its own programme, encouraging activities which are relevant both to the aspirations of their young people and to the needs of their home communities.

Most of the countries in which the scheme operates are not unnaturally in the Commonwealth, but there is no copyright, and numbered among award holders are young people from many non-Commonwealth countries.

A Congressional Award Scheme, based on similar lines to the Duke of Edinburgh's Award, will soon be launched in the United States of America, and one would hope that similar schemes might be introduced in other countries. The services of the Overseas Department of the London award office is always available to help in any way.

Clearly, the rising expectations of young people are not yet matched by the opportunities available to them, and it is only by making the best use of all available resources that we stand any chance of meeting the challenge of the restless discontent which now confronts us.

The Duke of Edinburgh Award Scheme provides a framework within which constructive and rewarding activities for young people of all nations can be developed and enjoyed. Its programme could be used to promote the active involvement of youth in the cause of conservation throughout the world.

A Woman's View of Wildlife and Wilderness

ORIA DOUGLAS-HAMILTON

To have chosen South Africa for the first wilderness congress is indeed fitting for this is the first country in Africa to have benefited and suffered from technological transformations. Each time I come here I must remind myself that I'm still in Africa. The Africa that we know awaits the heavy hand of technology with trepidation. At this first World Wilderness Congress we have been inspired by all the good things and heard all the terrible things that man is doing to the world by destroying the wilderness and its inhabitants. The congress has been an exciting platform, and in the corridors and the tea breaks we have been provided with a marvellous waterhole for all the wildlife people to make their grunts and growls and talk about each other's problems. We have also mingled with people we have longed to meet for years.

It is through Ian Player and others like him that I have been inspired in the field of wilderness awareness education, a field which badly needs to be developed in countries like East Africa, especially Kenya-Uganda where we still have such huge untouched areas of wilderness, besides that in Tanzania, but all this is too often taken for granted.

The most important thing that I want to say is that we cannot allow this congress to have been simply a place where people talked. It is now up to everyone to take action on the good intentions we have heard and discussed – to stop destruction, to stop the killing, and the waste. As the Transkeian delegate suggested, we must use this opportunity to find practical ways to help the land and the people. So I would like to suggest three important principles among many others that have emerged which could lead to practical action.

The first is the need to make wilderness and wildlife an economic advantage to the people close to it. For instance, under a new policy in Kenya, the Masai who live in the Amboseli National Park, are actually paid compensation for the grazing lost to wild animals. International organizations can help, like the New York Zoological Society has done in this case. The locals have more power in their hands to save the wilderness than any other group.

The second point I wish to make interests me most. We should preserve wildlife by encouraging and persuading people in governments to sign and enforce the provisions of the Washington Convention on endangered species. I don't know how many people have seen animals killed: for carpets, for bedcovers, for ornaments, for fur. If there are only a hundred thousand elephants being killed a year – and we know that it's more – where are those tusks going? To make fourposter beds for rich people; to make lamps, to make jewellery – why don't they use plastic, it's much more chic to say, "My bed is made of plastic and not of ivory." There are all the beautiful animals

we have seen, the tiger, so beautifully camouflaged in its habitat, so graceful, so powerful – and all we want to do is to kill them. I know I am talking to the converted, but you've got to get up, you've got to go and talk to your countries, because we are all alone, there's just a small group of us working with elephants!

I know so many wealthy people in Milano, in Paris, in New York, in Los Angeles; they don't care where their things come from, all they want is to be able to show off that they have this in their houses. Vicuna covers on their bedspreads, they're not going to get any sexier by having that on their beds, they're not going to be more beautiful by wearing ivory. And the rhino horn: where does that go to? That just goes to feed some men who have sex hang-ups, and what are they going to do, produce more people so that we have more problems?

I met a Chinaman in the ivory trade, from Hong Kong, at the World Wilderness Congress – the first I've ever met. He spoke of his concern that skill in the craft of carving, which has endured for thousands of years, should not die out. I heard a terribly funny thing from this Chinaman. It's really rather sad. He said that in Hong Kong the ultimate, the best thing to have at dinner, to serve at table, to show that you are really an important person, is an elephant's penis. I'd much rather he cooked his own.

This brings me to the third point, which was so eloquently discussed by John Hanks – human population control. Here is a major problem, which must not be taken lightly. This is all I'm going to say as a woman because it's now up to you men who frame the resolutions to ponder on these principles and find practical answers.

Now I'm going to tell you a little about my life in the wilderness. Right now we don't really have a home because we haven't had the opportunity to have one. But we're very lucky, since we've had to establish our office in Nairobi and the children have had to go to school for the first time, even though I fought against that because I didn't really want them to be educated. We're living in a house just outside Nairobi and we have Rothschild giraffe who come and visit us at our verandah for breakfast; we have tea with warthogs who eat out of our hands; we have the wonderful whoooooop of hyenas which call to us at night and their sound drifts into our windows. The wildlife is still all around us, but I don't know how much longer Nairobi will be able to afford these luxuries. You see, in East Africa wildlife education is vital and maybe we will be able to introduce similar ideas like wilderness trails to young people, to politicians, to business people who've never been out of the city because it was their dream to come to the city. But the tide is turning and world consciousness is at last being awoken, realizing that the forests are going, the animals are going, the sea is dying, the deserts are creeping up and man is becoming more and more intolerant in his overpopulated world. Only a short while ago at the desertification conference in Nairobi Dr Tolbe stated very clearly that prevention is far cheaper than reclamation, and I think we can use these very words for our wilderness and wildlife.

But to go back a bit in my life: once upon a time, as a child, I lived on a farm in Kenya. I was able to roam the hills barefooted, I went hunting with

the Masai who looked after us, because my father was Italian and interned during the war and we were left alone with my mother for four years. We had the most marvellous time of our lives. We learned to track game, we learned to hunt for food, we learned to follow the honey bird, we learned to make fire with sticks and we learned how to clean our teeth with the wild toothbrush known as *mswaki*. Other times I went and herded the cattle with the wild people who looked after them and us. My mother had absolutely no control over us whatsoever. The Masai taught us not to be afraid.

This was part of my wild and beautiful life and it has stayed with me always. But like most people who come out from Europe to Africa my parents left Europe because they wanted to get away from the hypocrisy, from the towns. And yet they came to Africa and without realizing it they tried to civilize the land, the people, and the country, bringing with them their culture, their ideas and their technology, cutting back the bush to grow food, making roads out of little footpaths, putting fences around to protect the food, and keep the game out, shooting the game. I was an avid hunter, I killed everything I saw: I was only eight years old. But now, as the mother of two children I wish my children could go out there in the hills, could go and roam barefooted, could go and hunt, but there's nothing left: we've shot it all, and we're trying to bring it back very slowly but we will only be able to reclaim a tiny percentage.

Before I met Iain I spent fifteen years going around the world. In and out of cities, back and forth to Africa. Always taking for granted that the wildlife in Africa would never change. I knew it would always be there. But I was wrong and I was totally blinded because I knew nothing about it. When I met Iain I took my mother's advice who said, "Before you marry a man go out and live with him in the bush, go on safari, you've got no books, you've got no music, you've got no nothing, you just have each other; and then if you really get bored you know you're not suited to each other." So for once I obeyed my mother and I went out and I lived with Iain. I had to go out with him and learn about his elephants. I realized I knew absolutely nothing about elephants even though I'd lived all my life in Kenya. I knew nothing about the wildlife, I'd never studied them, I'd never bothered to stop and look what they were doing, and why they were doing it. I didn't know what ecology meant, I didn't know what ethnology meant, I didn't even know what a real charge or a mock charge was until I discovered that when an elephant hits your car, that's a real charge.

It took a year for me to understand, to learn. I was completely involved with Manyara. I was completely involved with the wildlife. I realize how terribly lucky I was. There were no other human beings around, there was just Iain, myself, our tracker, adviser and guide Mahodjo who has been with us for ten years. I could feel the rain. I could share the dry season with the animals. And yet I knew I wasn't supposed to do anything, I was just there as an observer. I realized that when you go to the places like the Serengeti, territory has been marked out for the animals and man is not allowed except to sit there and watch the thousands and thousands of animals wandering past, living together, not leaving a speck of dirt behind them as they move, follow-

ing the winds, following the rain, all living, co-inhabiting with each other, and then when the evening comes we have to get out and go back to our smelly polluted cities with stone walls around us.

Manyara is one of the places I have loved most in all the world. Now it is part of our continental programme and we can no longer live in the bush with the elephants the way we used to. Instead we count elephant carcasses and watch elephant numbers on the computer. It was a choice of continuing a simple happy life, or joining those fighting to conserve and preserve.

The Future of the Wild Lands of Alaska

LIEUTENANT GOVERNOR LOWELL THOMAS, JR.

Nine years ago on Christmas Eve as the United States spacecraft *Apollo 8* circled the moon, on-board cameras televised the mother planet, 371 910 kilometers away. Captain James Lovell remarked that the earth looked like a "grand oasis in the big vastness of space." To the millions of viewers watching the image of their blue and white sphere floating in a sea of blackness, the point was obvious: like *Apollo 8*, earth too is isolated and fragile – the only body in the universe known to support life.

The maintenance and preservation of wilderness is essential to knowing and maintaining the fragile life web on which all of us depend. Perhaps this is nowhere more apparent than in the land of Alaska – my home for the past seventeen years. Let me give you a thumbnail sketch of Alaska – the forty-ninth addition to the United States of America. But first – my definition of wilderness as taken from the United States Wilderness Act of 1964: "A wilderness . . . is . . . an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." Alaska was named the "great land" by an early people, to convey its immense scale and variety, as well as its overwhelming beauty. It is a sprawling land of superlatives: 1 517 733 square kilometers, 74 060 kilometers of shoreline, 151 875 million hectares spanning twenty-one degrees of latitude and forty-three degrees of longitude, and spread over four time zones which encompass 3 864 kilometers. About twenty per cent larger than South Africa, Alaska is a land of "continental magnitude."

Its physical features are as awesome as its immensity: three million lakes 16,2 hectares or larger, 4,4 million hectares of glaciers and icefields, 10 000 streams and rivers totalling over 587 650 kilometers in length, 100 volcanoes with forty-one active, seven mountain ranges with nineteen peaks topping 4 256 metres and 6 177,3 metre Mt. McKinley, the tallest mountain on the North American continent and almost 304 metres higher than Africa's Kilimanjaro.

A member of an 1898 expedition to Alaska, Henry Gannett wrote: ". . . nowhere else on earth is there such abundance and magnificence of mountain, fjord and glacier scenery . . . The Alaska coast is to become the show place of the entire Earth and pilgrims not only from the United States but from beyond the seas will throng in endless procession to see it. Its grandeur is more valuable than the gold or the fish, or the timber for it will never be exhausted." Yes, it is one of earth's last relatively unspoiled wildernesses – a land both blessed and burdened by her riches. We possess both the natural resources essential to American industry and to other Pacific rim nations in the coming decades, and the spiritual resources of spectacular wilderness,



Mount McKinley, towering 6 177,3 metres into the sky, is the world's highest mountain measured from its base to its summit.

untouched landscapes and scenic beauty. Beyond that we possess perhaps the scarcest of all resources – the potential for land-related lifestyles of a different, simpler era to which many Alaskans passionately cling.

In 1880, before the big gold rushes north, only four hundred and thirty or so non-natives were counted in the territory of Alaska, and as recently as 1940 there were only 40 000 whites and 32 000 natives! All that has changed. Alaska today has a booming population of over 400 000 – although that is significantly less than the city of Johannesburg! Booming it is, for the predicted rate of increase will boost our population fifty per cent in this decade. Today we have plenty of elbow room with 3,63 square kilometers per person, compared to 0,0025899 of a square kilometer per person in South Africa.

A decade ago Alaskans took pride in pushing back the wilderness, treating it like an enemy as they sought economic development and expansion. Today the focus has shifted to long range land-use planning and orderly development.

Largely because of the frenzied activity surrounding North slope oil and gas development, particularly the Alyeska oil pipeline which has been in operation now for five months, Alaskans have become increasingly sceptical about rampant economic growth. The impacts of our recent boom soured many who now realize that economic development does not solve all their problems. Our unemployment is double the national average, jobs are limited, housing is scarce, crime is up, government services are nearly overwhelmed and inflation is widespread.

Yes, Alaskans have crossed over the great divide between unbridled de-

velopment and planned, orderly growth. One evidence of this was the election of Governor Jay Hammond and myself in 1974, running on a platform of: (a) respect for the environment and strict observance of environmental safeguards; (b) orderly, well planned development; (c) maximum public participation in decision making.

The Governor and I firmly believe that Alaskans are capable of managing the growth and development of our state. We recognize the priceless natural and cultural heritage we possess and our obligation to pass it on very nearly intact.

More and more, Alaskans and people everywhere are beginning to realize that a variety of lifestyles can exist harmoniously only if we support changes and some restrictive measures relating to the exploitation of our resources.

One area where my state is working toward a co-operative effort with our federal government pertains to our national interest lands. Six years ago the U.S. Congress passed the Alaska Native Claims Settlement Act which extinguished all native land claims in exchange for a grant of 17,82 million hectares and one billion dollars. That act also required the withdrawal of some 32,4 million hectares of Alaska to study for reclassification as new national parks and forests, wildlife refuges, and wild and scenic rivers. Congress will have made the final selection by December 1978, and the issue is threefold: (a) to preserve in the national interest the wildlife populations, wildlife habitat, and scenic wilderness located on unreserved public lands in Alaska; (b) to preserve these values while simultaneously helping the nation meet its needs for energy and other resources; (c) to preserve these values with full consideration of the spirit and purpose of the Alaska Statehood Act and the Alaska Native Claims Settlement Act.

The complexities of this selection are enormous. Various legislative proposals are currently under consideration by Congress. The most controversial of these comes from Morris K. Udall, chairman of the House Interior and Insular Affairs committee. His bill would increase the withdrawal to 47 million hectares and place all of it in national parks and forests, wildlife refuges, and wild and scenic rivers; converting nearly one third of Alaska into "instant wilderness." The state does not support this extreme view, nor do President Carter and his Secretary of Interior, Cecil Andrus. The President's proposal reflects many of Alaska's recommendations and, I believe, will prevail. It speaks to a selection of some 37,26 million hectares, provides for co-operative management through a federal-state planning commission, provides that much of the land be studied for seven years to determine accurately its best use, and it further mandates periodic review for justification of whatever status may be designated. The President's proposal also recommends completion of the conveyance of federal lands to the state as defined in the Alaska Statehood Act of 1959 (we at present have title to only about one third of our promised 42,12 million hectares). It reaffirms state management of our fish and wildlife resources and establishes a preference for subsistence uses of the land.

As expected, some business interests within Alaska, and without, view

all this as an attempt to lock up the land and its resources – to turn the state into a vast national park; while on the other hand many environmentalists say that not enough wilderness will be protected. I believe President Carter's proposal strikes a pretty good balance, that its probable adoption by Congress will guarantee ample Alaskan wilderness for future generations of Americans, at the same time ensuring access to most of the state's natural resources. Reclassifications can be made later on if need be.

I mentioned earlier that Alaskans have become sensitive to the quality of their economic development. Nowhere is this more evident than in the development of our large reserves of crude oil.

We joined the ranks of major oil exporters when the 1 288 kilometre oil pipeline from Prudhoe Bay to Valdez became operational. About 800 000 barrels of oil flow down this utility corridor every day, destined for ports on the west coast of the United States and other areas. Soon that volume will increase to 1,2 million barrels per day. One of our major priorities is to ensure that this oil is transported in the safest manner possible.

To meet this goal, our state legislature passed two pieces of legislation in 1976 – laws authorizing the state to promulgate safety and manoeuvrability standards for oil tankers, to regulate their traffic and to enforce penalties. They also established a coastal protection fund which requires owners and operators of vessels and terminals to establish proof of financial responsibility.

Another new law sets stringent civil penalties for the unlawful discharge of oil, providing an indispensable tool for us to control the integrity of oil-handling operations. In effect it says, "You shall not spill oil, and if you do, you will pay dearly."

Another conservation advancement was the creation in 1971 of our state department of environmental conservation, empowered to enforce environmental laws and regulations, and required to assist citizens, communities, industries and other agencies in planning avoidance of damage to the environment.

As an indication of our commitment to environmental protection, we conducted a voluntary environmental impact statement on submerged state lands north of Prudhoe Bay in the Beaufort Sea before considering any leasing agreements for oil and gas development. Public hearings to obtain the opinion of Alaskan citizens were held. Although state law does not require environmental impact statements, we insisted on one because we wholeheartedly support the United States National Environmental Protection Act and the Alaskan public's right to know what developmental impacts can be expected so that a balance can be struck.

As my friend, the late Charles Lindbergh, said several years ago: "We, of course, must use our natural resources, balancing their use against availability and future needs. Some resources – oil and minerals and soil, for example – are non-renewable, and we have to mete them out carefully; others – our forests and game animals – can be renewable, if we don't exhaust them. The pre-eminent task is one of balance. We must always balance."

General Lindbergh visited Alaska about eight years ago, addressing a

joint session of our legislature at a time when I served in that body. He talked to us not about aviation but about conservation and the need for great care in developing the state. Here, in part, is what he told us:

"We are in grave danger of losing the environment we inherited from all time past. Whether we lose it or not depends on laying plans now to preserve what is necessary to preserve.

"I don't think there is anything more important than conservation other than human survival, and the two are so closely intertwined that it is hard to separate one from the other.

"If we destroy our environment our survival is not going to be very satisfactory.

"The action you take here is not simply for Alaska, it affects people all over the world particularly in the 'lower 48' . . ."

The advice of this splendid human being who was one of the world's leading crusaders for environmental conservation, had a strong and lasting influence upon Alaskan leaders at a crucial moment.

A year or two later, Charles Lindbergh paid us another visit. On that occasion I had the honour and thrill of flying him in my single-engine aircraft over some of our mountain-glacier wilderness – an experience and privilege I shall never forget!

Another topic of recent concern is the delivery of natural gas from Alaska's north slope to the lower states. There are 740 000 000 000 cubic metres of natural gas at Prudhoe Bay alone – or one tenth of America's known reserves. And this gas will be transported by pipeline across Canada according to a presidential decision, subject to expected congressional approval. Alaska fought hard and successfully to block an early routing proposal that would have breached our 36 450 000 hectare Arctic wildlife range with its herds of caribou, migratory bird life, bears, wolves and the rest. I am especially pleased that legislation dealing with Alaska's lands now before Congress will give wilderness status to our Arctic wildlife range, ruling out oil and gas exploration. That is one Arctic area that deserves protection. The gas line instead will follow the Alyeska oil corridor to Fairbanks, then the Alaska highway down through Canada, thus minimizing further environmental harm.

Another facet of Alaska's wilderness is its animal life. Important waterfowl and other wildlife populations reside in eighteen national wildlife refuges, one national park, two national monuments and two national forests.

On state lands, tidelands and waters, our department of fish and game manages a small but expanding system of seven state wildlife refuges and sanctuaries, and ten critical habitat areas. In addition, the department has identified forty-six areas where there is full or partial closure of the harvesting of fish and wildlife.

I understand that about twenty per cent of the entire North American waterfowl population breeds in Alaska. This includes over twelve million ducks, one million geese, 70 000 swans and 150 000 cranes.

We also have habitat for several endangered species – such as the Aleutian Canada goose and American and Arctic peregrine falcon. Although the bald eagle is considered endangered in many parts of the United States, our national bird is thriving in the far north.

Alaska contains habitat for many terrestrial mammals from such small furbearers as beaver, lynx and fox to larger animals such as moose, sheep and several species of bear. Caribou make their home on the tundra, feeding on lichen. The Arctic herd numbers around 300 000 and makes seasonal migrations of hundreds of miles from the shore of the Arctic ocean to south of the Arctic circle.

Twenty-seven species of marine mammals – including whales – abound along our coastline. All but the walrus are managed by the United States Government under the Marine Mammals Protection Act of 1972, and their survival seems pretty well assured, although there is some question about the bowhead whale upon which our Eskimo people have long subsisted.

Sea life exists in great variety in Alaska's marine waters. Lakes and streams also support many fish, including five kinds of salmon, steelhead and rainbow trout, lake trout, greyling, Arctic char and white fish. Alaska's freshwater and marine fisheries are in demand for subsistence, commercial and recreational values. And our fish are ecologically important in food chains and nutrient cycles for they are an important food source for such wildlife as the bald eagle, beluga whale, brown grizzly bear and polar bear.

My state provides a classic demonstration of the interrelation of living things. At every level of its environment, Alaska offers one of our planet's last opportunities for study and exploration of the life processes on a grand scale.

Admiralty Island brown bear, whose south-eastern Alaska island home boasts some of the largest trophy animals in Alaska, meanders over an open glade. The bruins are especially easy to photograph in the fall when they congregate in the salmon streams.



It is becoming ever more evident to outsiders that we are deeply concerned with environmental controls. This summer our governor signed into law an act "relating to the management of the coastal resources" of Alaska. As a result, from now on we will have planned allocation of space in our coastal zones.

Our position on Federal development of Alaska's outer continental shelf has succeeded in slowing down such activity so that we can be more certain of being able to manage it. Time is essential for building up environmental protection and to plan for on-shore impacts. Although our state and Federal governments share a common goal in the quest for new energy sources, Alaska will not allow gluttonous, on-shore facilities, serving off-shore oil fields to gobble up prime lands or consume critical wildlife habitat.

In response to public support for resource preservation Governor Hammond initiated – and has now completed – re-purchase agreements of all major oil leases in Kachemak Bay which lies off the south-central Alaskan coastline and is extremely rich in marine life. Notwithstanding that fact, the previous state administration had sold our oil resources in that bay without any real reflection upon the consequences other than to gain immediate revenue to run our government, amounting to some \$25 000 000. When our current administration came into office, we worked with the citizens of Alaska and our state legislature to re-purchase those leases because of the serious environmental questions involved, and the risk to an important fishery. I wonder if such a re-purchase of oil leases has ever occurred before, anywhere in the world?

And so goes the struggle to spare wilderness in my northern corner of the globe – successfully at the moment, and I am optimistic about the future; for Alaskans – and Americans in general – are showing a growing awareness of the need for sound conservation. My sentiments can best be summed up in the words of Charles Lindbergh who said: "The quality of life depends on a selection of life. Without selection there can be no progress. This is the lesson that wilderness offers to the mind of civilized man. Since it has been the way of life from the beginning of life, it must contain a lesson of God."

Wilderness and the Trees

R. ST. BARBE BAKER LL.D. FOR. DIP, CAMBRIDGE

My etymological dictionary of the English language defines wilderness as a wild or waste place; an uncultivated region. For millions of years before man appeared on earth the trees were working, purifying the atmosphere, cleaning up the fetid swamps and breathing life-giving oxygen into the atmosphere. The trees are earth's green mantle and the nostrils of the earth.

Tragically, of the earth's 12,141 billion hectares already 3,642 billion hectares are desert, forsaken, desolate, uncultivated. I look at it this way: if a man loses one third of his skin – insulating the inside from the outside – he becomes feverish to the point of death. A plastic surgeon says he is doomed. If a tree loses one third of its bark, the botanists and dendrologists have little hope of keeping it alive. I submit that if the earth loses one third of its green mantle of trees, it too will become feverish, the spring water table will sink and it too will die. In fact the earth is being skinned alive.

The ancients believed that the earth is a sentient being and feels the behaviour of mankind upon it. As we have no scientific proof to the contrary, I submit that we should accept this point of view and behave accordingly. It would seem that we are getting very near that dangerous one third with the oncoming deserts of the world.

Although man owes his existence on this planet to trees, he has been cutting and burning greedily and recklessly until today he is being threatened not only with famine in timber but a world famine in food, water and oxygen. The first product of the trees is oxygen. Man lives less than five minutes without air, and trees provide the life-giving oxygen from their leaves. It is of grave concern that the last best oxygen bank of the world is being invaded. The virgin forests of the Amazon are being felled to make beefalo farms to grow buffalo beef that is boned and put on high-flying planes and when it gets to Tokyo, it is frozen. We have to admire the ingenuity of the Japanese concession holders. Whether they realize it or not, Brazil is being skinned alive to grow beef for a people who were largely vegetarian and might have been setting an example to the world in a silvan economy.

A man lives less than five days without water, and tree-cover is essential in the water cycle. On the fringe of the Sahara, a single eucalyptus tree of forty-five feet high will transpire up to 374,25 litres of water a day into the air. A forest of these trees will create a micro-climate in which food can be grown on land that has been desert for two thousand years.

Along the seaboard of California, 91,2 metres high coast redwoods, *Sequoia sempervirens*, catch the coast mist and assisted by the water that they transpire from their feathery foliage precipitate rain. The hotter the day, the

more the early mist and the more the rain will fall by this so called horizontal precipitation.

A man lives less than five weeks without food, and upon the trees he is dependent for the quality and quantity of his food. When man removes tree-cover as in the invasion of North Africa by the Romans, he forms a dust-bowl which spreads at compound interest. The larger the denuded area the more rapidly it spreads. The few remaining forests of North West Africa were invaded by nomadic farmers, who with their goats would not allow tree growth in their wake, with the frightening result that they found themselves in a wedge of the forest, with desert a thousand miles behind them, and a thousand miles in front of them. With the end of the forest in sight they settled down to die out. Chiefs forbade marriage and women refused to bear children for certain starvation. It was an example of racial suicide on a scale that the world had never before seen.

It was the report of this tragedy that in 1922 alerted me to found the Men Of The Trees. At that time I was assistant conservator of forests in the highlands of Kenya and with little or no support from Government inaugurated a voluntary movement for tree-planting. I found that the Morans or young warriors were dancing from camp to camp. "Sufficient unto the day" was their motto. They did not seem to mind how far their women-folk had to go to fetch wood to cook their food. I sent for the captains of the dancers, and when they came to my camp I said, "You have a dance when the beans are planted, and another when the corn is reaped. What about a dance for tree planting?" They said: "Trees – that is *Shauri Ya Mungu* – God's business." I said, "If you cut all the mother trees down, you don't give Mungu a change – I have an idea, in three weeks time, we will have a special dance in my camp – at *Muguga* (a treeless place). I will offer a prize for the best turned-out warrior and a necklace of their favourite beads for the most beautiful damsel." Three weeks later, three thousand Morans assembled for the first Dance of the Trees. The story is told in *Dance of the Trees*, with a foreword by Sir Arthur Bryant. It may suggest ways in which armies of volunteers in the countries which they represent could be enlisted to stem the oncoming deserts in each country. Have we not all reaped where we have not sown? We have exploited the deep rich accumulated wealth of the prairies to grow wheat. We have mined the stored-up wealth of the millennia to stoke our furnaces, and petroleum for our transport, neglecting to use God-given solar energy and such renewable resources as trees.

We have ignored the healing properties of trees as taught in ancient wisdom. In her introduction to my latest book *Trees for Health and Longevity*, Dr. Nadya Lamprill has said, "Trees are silent, unassuming, devoted healers . . . They give man the nerve forces which help him to endure . . ."

The restoration of tree-cover to a sadly denuded planet could become a one world purpose, perhaps starting with the world's largest desert – the Sahara of Africa, as described in *Sahara Challenge* and *Sahara Conquest*. The latter won the Millennium Guild of New York – Book of the Year award for making the greatest contribution to humanitarianism. These have now been followed by *Desert Conquest – Key to Man's Existence*.

The world is in the doldrums. Having conquered space and surveyed other planets, man must now become concerned with his own planet and his own wilderness. We of the Sahara Reclamation Programme are humbly grateful that fifty-eight countries and international organizations have agreed to concerted action to stop the Sahara spreading over more of Africa. The first phase estimated to cost R2 602 million is expected to be completed by 1982, and will be financed by grants from donor countries and the Organization for Economic Co-operation and Development. We are profoundly grateful to the Ottawa conference chairman Boulama Manga, Minister of Rural Development in Niger and Jean Pierre Goyer, the Canadian Minister responsible for relations with Francophone countries as well as to my old friend and classmate, John G. Diefenbaker, P.C., Q.C., Chancellor of the University of Saskatchewan, and of course the Canadian Government, who generously lent me a plane to demarcate lines of shelter belts between Chad and Niger and draw attention to the urgency of accepting the challenge of the Sahara.

In their foreword to my book *Desert Conquest – Key to Man's Existence*, the writers have referred to the Sahara Reclamation Programme as a "charter of sanity." They say that "co-operation on a large scale in the case of the Sahara would go far to change the political climate of the nations . . . in a sorely perplexed world, this book is a sweeping charter of sanity that points the way to sound prosperity, well-being and peace not only for the uniting states of the Sahara, but for all of us."

The world of today is confused. The world of tomorrow will be what we choose to make it. Let us make it a world with tenable new objectives and new methods of reaching those objectives. We need new loyalties, loyalty to the very earth beneath our feet, to the neighbour at our side, and to the light that comes from above or within. Man as an individual or a national does not reach maturity until he discovers a cause to which he can devote himself and in which he can lose himself. Instead of living for himself or his nation, let him take part in a great endeavour which will defy the years and outlast time itself. So it might be with the nations of the world. As they sink their individuality and nationality in the cause of recovery by tree-planting they will gain immortality. Theirs will be an ever-increasing admiration of the world of men here and now and of generations yet unborn. Each of us has a solemn responsibility to spread this message, for, unless we can make the world a better place for all of us to live in it will not be a fit place for any of us to live in. Let us heal the naked scars in the earth and restore her green mantle. Let us set our earth-family in order. Let us be men and women, and not predatory beasts. Shall it be said that the forces of evil can outweigh the forces of good? Let us meet force with gentleness and see beauty and goodness in all things and people.

Let us even now bless the new day as the desert reclamation idea dawns. Let us cross the threshold of opportunity, each of us staking our claim of service in this epoch-making humanitarian enterprise which will set a new and permanent pattern for human thinking and behaviour. A worldwide participation in desert reclamation starting with the Sahara will bring forth

the noblest instincts of man. Let this be the basis of world federation – the federation of mankind. Let the countries of Africa now convene a world parliament to this end – the Parliament of Man.

My old friend Wilson Macdonald, poet-prophet, had such strong feelings that the Sahara Reclamation Programme may be the world's last chance to save the planet from destruction that he sent me this exhortation.

Join hands ye nations, this is the last call!
Join hands ere the play ends and the curtain falls.
Gun and bomb and sword have had their play,
Now for the living word, and the king's way.
Let peace be the bridegroom, if He is denied –
Death will take his place, and earth will be the bride!
It is for you to say:
Join hands ye nations, this is the last call,
Join hands ere the play ends and the curtain falls!

Let there be no mistake. The enormity of the Sahara Reclamation Programme dwarfs any other reclamation and rehabilitation project ever before planned. The overwhelming benefits to the world which can stem from the project cannot be described any more than one can describe the feelings of a man watching the first bright shaft of sunlight that follows a night of pain and unrest.

I believe that the delegates to the first World Wilderness Congress have it in their hands to influence their governments, and it is to be desired that they will see in this a one world purpose upon which their survival depends.

KwaZulu and Wilderness

THE HONOURABLE MANGOSUTHU G. BUTHELEZI

Contrary to the expectations of many, I am a wilderness enthusiast. As you can imagine I get quite a voluminous poison-pen mail, and although not all of it always reaches me, now and then I get angry letters telling me that I must return to the mountains and to the trees where I and my people belong. I am always filled with pity and amusement for that back-handed expression of their own superiority over me, by writers of such letters. In the first place my reaction to such attacks is that I and my people are living in the mountains in any case, and we live amongst the trees. We are still part of the wilderness of Africa which mothered us. In other words we do not need racists with an inflated sense of superiority to tell us that this is where we belong. At the same time I often think that it is a pity that these cowardly writings are anonymous, for I often wish that I could invite the people possessed of such arid minds which produce these kind of letters to the peace and serenity of the wilderness. For only in the wilderness, in the mountains and amidst the trees can they become rehumanised. It is in the wilderness that their minds can develop and produce ideas instead of the kind of garbage they churn out as a symptom of their decadence and megalomania.

In a way the invitation extended to me to attend a congress of this magnitude is an expression of the chairman's confidence in my own integrity. I realize that when one is as controversial a figure as I am, few people are able to see in such a person as myself any redeeming feature. I appreciate therefore that the invitation to someone like me is extended in spite of voices suggesting the contrary.

I think it would be wrong and dishonest of me not to tell you in brief about the problems facing a black wilderness enthusiast such as myself. Through western technology most of the wilderness of this land which at one time was controlled by my people is no longer under their control. If I quote that just about 13 per cent of the surface area of South Africa (including the Transkei) is under the control of blacks, you will appreciate what I mean, particularly when I state at the same time that blacks are about eighty per cent of the entire population of South Africa. Some of the big problems of a black wilderness enthusiast like myself begin right there, particularly if he is playing the role I am, where as a representative of the have nots of this land, I must attempt to reconcile the common interests of my people with those of the haves of this land in a non-controversial pursuit, such as the preservation of our wilderness. These rations make my people land-hungry. This faces them more and more with the issue of survival within the reality of their situation. This means that more and more of my people, who with me belong to the wilderness of Africa, see my enthusiasm for the wilderness getting less

and less relevant to the major issue of just their sheer survival. I still pursue my dream of preserving our wilderness in spite of all this because I believe that once we stop doing that, we will lose our balance. I am convinced that once we stop being wilderness-oriented, we are likely to feel caged, with the resultant desperation that overcomes all caged animals even if they belong to the species *homo sapiens*.

These, then, are my problems and the situation from which I am operating. In May 1971 I spoke at the Game Conservation International Conference, in San Antonio, Texas, in the United States. What I have to say now largely re-affirms my statements about conservation in South Africa, which I made on that occasion.

The game reserves of my region, particularly Umfolozi and Hluhluwe, featured prominently in the history of our Zulu country before the area was settled by whites. Zulu leaders in those years were aware of the economic and spiritual values of the game areas long before white men of great wisdom, like Sir Charles Saunders, were involved in their proclamation. These parts of the Zulu wilderness were economically valuable because of the trade value of ivory, skins and other game products. I suppose even at that time Zulus were not different from other human beings, who at one time or another seek an opportunity to express their supremacy in the whole animal kingdom. The wilderness gave them that opportunity.

When the Zulu people were conquered by the British in 1879 wildlife unfortunately became of secondary importance to the politics of survival. White hunters of the non-sportsman type, employing Zulus with ex-war firearms, decimated much of the game in all but the inaccessible areas. These are the sad facts of history. They are stated as a record of what happened rather than as a mutual recrimination exercise. The happier facts are that most of the wildlife strongholds, including gems like Lake St. Lucia and Ndumu still exist as game reserves. The contribution of various Zulu and white people to the survival and management of these international draw-cards cannot be lightly dismissed. It is a major achievement which reached its zenith in the 1960s when wild game conservation had become so good that it was possible to capture thousands of surplus animals to replenish the areas long divested of them. I refer here to the world famous Operation Rhino and the subsequent operations to transfer wild animals of many species in and beyond our borders.

The majority of the big game reserves lie in what will undoubtedly be part of KwaZulu. I am not necessarily referring to KwaZulu as seen through the white administrators' eyes as part of the separate development scheme, but KwaZulu as it was known in historic times. Obviously we are going to play a major role in the management of these priceless areas and I want to make it clear that we appreciate the historic, cultural, spiritual and economic value of wildlife and wilderness. That we sprang from the wilderness hardly needs emphasis. I do not want anyone to think that when these areas pass to our control that we are going to be any less aware of their vital importance or any less able to manage them. The wilderness is our natural habitat for it is here where we were forged as a people.

I will say that I have different ideas about how they will be managed because it is obvious to me that the present "Zululand game reserves" are becoming over-developed. I believe their chance of survival lies in their retention in the most primitive state possible – in wilderness – and to this end I will do all I can to see that the new management practises peripheral development. I will also ensure that future generations of whites have as much chance as blacks to enjoy what facilities we have, because wildlife conservation is as vulnerable to a policy of segregation as everything else in South Africa. What has happened in the past where game sanctuaries became exclusively the playground of one race group will not be allowed in game reserves under our control.

In our plan we have a department which deals with wildlife conservation – of which wilderness is an integral part – historical areas and tourism. I shall furthermore ensure that I get the best personnel, irrespective of colour or creed, to run the department. Our historical areas have been sadly neglected. I want them to be living monuments, not something recorded in concrete and stone. Tourism is also of economic importance as well as a bridge to better understanding between nations. But I would never allow tourism to kill the goose that lays the golden egg. This can happen so easily. Our policy will be to have the maximum number of people enjoying the tourist areas with a minimum infringement on aesthetic, cultural and other values. We want people to go away having learnt something about the history and culture of our people.

It is fitting that the first World Wilderness Congress should have been held in South Africa, because we have struggled harder than most to ensure the survival of some wilderness. As a practising Christian, I believe the wilderness experience is necessary in the development of all people. In the wilderness barriers fall away and we can all see each other for what we are worth. If more leaders of the world could meet in the tranquility of the wilderness, I believe a better understanding would grow. The big price we are paying for the humdrum that is part of civilization is to lose some of our balance and sanity. Nothing restores this balance and sanity more than the wilderness.

I want the world to know that I subscribe to the importance of wilderness to mankind, despite the odds stacked against me and my people.

Highland Scotland – Its Wilderness and Wildlife

FINLAY MACRAE

When the ice with its quiet, imperceptible movement slipped out to the ocean, carving the corries and shaping the glens, highland Scotland accepted its present form – a highly distinctive landscape, unique in the British Isles.

This wilderness landscape, scraped in places to the bare rock, although small in terms of land mass, is vast in geological and ecological stature. It is of vital importance to a small highly developed country with its largely industrialised and congested population.

Since the concept of wilderness is extremely variable and largely relative, what does it mean to the average Scot of today?

To the city or suburban dweller in his tidy well-ordered surroundings it may mean little more than the rough common land where he exercises his dog.

For the farmer on the deep rich soils, highly mechanised and profit-conscious, it may be the yellow broom-clad slope, harbouring the rabbits that tailor his young barley, or the fox that takes his poultry one day and provides his sport a day later.

To those who live in highland Scotland the wilderness lies far above and beyond the meagre croft land and the gentle birch slopes, where the rough grey sandstone bosses stand sentinel through the great blanket of moorland and bog overlying the aged and infertile gneiss and schist.

The definition of wilderness is as personal as its impact upon the individual; it has been described to me by an old fellow countryman as the place where two is a crowd. A deer stalker described it as the place where you hear your every heartbeat and breath, as you prepare to take your shot.

For some, it has deep and lasting excitement and is vitally therapeutic – for others, it generates an uncontrollable sense of fear.

Wilderness is for all ages – the barefooted boy squirting soft brown mud or peat up through his toes on a hot summer day experiences the thrill of wilderness just as strongly as the bird-watcher tingling to the sight of the mountain eagle or the screech of the peregrine. Even the old feeble man who watches from his cottage, as the black gabbro peaks of some western island stand bared against the blood red of the setting sun, absorbs the impact of wilderness.

My own personal wilderness lies to the north-west of Scotland's most prominent geological fault, the Great Glen, where three large freshwater lochs have been linked to form the Caledonian canal, a useful route linking east and west. The most northerly loch harbours one of the world's most sought after creatures – the Loch Ness Monster, which has so far eluded man's efforts at closer scrutiny or captivity. Perhaps it is impossible to cap-

ture a fantasy. I include in my wilderness the Hebridean islands of the western Atlantic, far out to the gannet clad stacks of the lonely island of St. Kilda, perched as it were on the edge of the world.

It has been my privilege to spend my boyhood and my working life in this environment and if I have one regret it is that my knowledge of my native heath is all too scanty.

My connection with wilderness has been through the forest, the mountains, and the wildlife, but specifically through my work in the regeneration of our native pinewoods and in the conservation and control of our indigenous deer.

In small pockets throughout the highlands, remnants of the once great indigenous forest of Caledon still persist. These ancient woods are the most westerly survivors of the true Scots pine which has a very wide distribution in Europe and Asia. They were dense, dark forests inhabited by a small and savage breed of people when the Romans decided that north Britain was really wilderness, and was better left that way. Although much depleted since early Christian times they have persisted despite climatic changes and man's mismanagement to survive, if only as remnant.

Scientifically, their perpetuation is all important if only to retain the complete gene pool of yet another distinctive and seriously threatened type of forest. If we have any claim to primeval forest in Scotland this is it, and to walk among the ancient pines is to walk in and feel for the past. These small scattered remnants are important nuclei in the wilderness scene. Their flora and fauna is unique and their disappearance would leave an irreplaceable gap in our natural history store.

Perhaps their greatest importance to man lies in the sheer elegance and variety of their composition, occupying as they do some of the most spectacular scenic enclaves in our wilderness.

At one time the forest harboured the bear, the wolf, the lynx, and the wild boar, but that day is long past and many of the creatures it once sheltered have long since disappeared, and we will probably never see them in this setting again. The forest itself came precariously close to extinction.

The degeneration of the pinewoods was brought about by ignorance and greed, elements which have often combined to bring about a decline in our environmental wealth.

The requirements of charcoal for the iron smelting industry, the firing of the forest to extend grazing pasture or flush out the rebellious lurking highlanders, man's need for fuel, and the combination of predator destruction and immense grazing pressures of domestic stock and deer, almost destroyed one of our significant natural assets.

The decision to regenerate these historic, aesthetic, and scientifically valuable woodlands was taken by the Forestry Commission in the mid-fifties and I am privileged to have worked on the main pilot project. Today, moves are afoot to salvage, repair, and restore all the important native pinewoods of Scotland, many of them in private as well as public ownership.

While the work has been slow, and at times frustrating, it has never been tedious, although it may take a hundred years to recharge the regenera-

tion cycle – and some artificiality is unavoidable. Regrettably, while the woodlands receive this “kiss of life” the level of browsing animals must be drastically reduced, but they have sufficient survival reservoir in adjacent forest and in the well sheltered glens.

When the woodlands are repaired, an increase in the browsing mammal population is entirely feasible, but this must always be subject to control by highly skilled supervisors and hunters.

Perhaps the animals most closely associated with highland wilderness are the red deer – our largest indigenous mammal. They are present in super abundance, the population being in the region of 250 000. No other country in Europe has such a high red deer population, and in most other countries red deer are found only in woodland.

When the highland forests disappeared red deer adapted themselves to life on the mountain, overwintering in the glens, and seeking the short sweet grass of the high tops in the summer. There was a decline in their body weight, but they are hardy, healthy creatures, who survive all but the longest and most severe winters with the minimum of shelter and the most meagre rations. No other animal is as well adapted to turn the poor vegetation of the wilderness into rich protein, and their meat is now highly prized and valuable.

Their greatest value to man lies in the sport they provide, and to spend a sunny September day of light breezes, stalking red deer, high on a Scottish mountain, is to experience our wilderness at its very best.

The return of forest is slowly changing the whole wildlife habitat in Scotland and nowhere is this more evident than in the return of red deer to the conditions of shelter and seclusion that they previously enjoyed.

There is active research into population dynamics, overwintering requirements, damage to woodland and other upland crops, and into new management techniques. This is highly commendable in scientific and monetary terms since red deer are the gold of the high, bare mountains.

Highland Scotland – with its bare mountains, its open structured natural woods of pine, birch, rowan and alder, the lochs, the tumbling rivers of clean clear water and its wildlife – has much to offer the native, far less the millions governed by the clock, the bus, the conveyor belt and the factory whistle.

Despite the proximity of this wilderness to the densely populated industrial belt, very little use is made of it, and one can walk through the passes, across the moors, and along the sharp ridges for days on end without encountering a living soul.

I feel that we make insufficient use of this free natural laboratory, where education in the ways of the wild could play such a vital role in the physical, and perhaps more important, the mental health of our young people.

The movement of people to the coastal fringe in the highlands, to the small market towns and to the southern cities means that the wilderness is in fact extending, and this vast playground is capable of absorbing large numbers of people with no fear of structural depletion or risk to wildlife.

The recreational potential is immense, with hill walking, orienteering, fishing and hunting as desirable pursuits. For the older and those not so fit

there is space, and time to sit around and think about nothing in particular and draw refreshment from nature's fountain – even if only in the enjoyment of deep silence.

It is impossible to evaluate this wilderness in monetary terms, but those who really love wild places and the creatures that dwell there will act as the wise stewards of a priceless heritage.

The regeneration of forest, and the replenishment of the wildlife larder go hand in hand and I believe that we are on the threshold of recognizing the real value of our wild places, and that further education will enable us to make full and wise use of this easily expendable resource.

To those among you who have never been to highland Scotland, let me recommend it.

A Propaganda Strategy for Wilderness

T.C. ROBERTSON

Africa, possibly the oldest of the continents, the hardened heart of ancestral Pangaea, is a good vantage ground from which to survey the vestiges of wilderness that remain on earth. We should ask ourselves why there are so few of them left on the Oikounemene, the inhabited part of the globe.

Fortunately, there is a fairly detailed written record to show how the white Africans, after their arrival in April 1652, used their herds, fire, the axe and the plough to perform the feat of "taming the wilds" on the shield-shaped land mass south of the tropic of Capricorn. It was a prodigious task of which, like all pioneers, they were justly proud.

Let it not be forgotten that, when Jan van Riebeeck stepped ashore, the Cape peninsula, in its beauty and in the diversity of its fauna and flora, was a wilderness such as Thoreau and John Muir had never dreamed of. Within days the sailors had shot hippopotamus – and their descendents, unaware of the grim symbolism, built a church on the spot. They joined the Hottentots in a leopard hunt and demonstrated the superiority of the matchlock over the bone-tipped assegai. The first farmers were rewarded with the price of a cow if they shot a lion. In 1655 a rhinoceros, bogged down in a salt pan, was shot. It is not recorded whether the trophy, which should have been well cured, subsequently adorned a wall in the castle – an escutcheon with a dragon and unicorn as supporters.

However, the deterioration in the environment must have been so rapid, even to men who could not see with the eyes of ecologists, that action was soon taken to limit the felling of trees. To these Dutchmen a wild animal was *res nullius*, a thing that belongs to nobody. But within five years after their arrival, in the Placaat of 1 January 1657, they had to place restrictions on hunting.

The white man, despite the pole-posters of carping critics, is not the only perpetrator of evil in Africa. The journals of David Livingstone reveal how efficient the hopi, or game pit, was in destroying the herds of Botswana. Zulu hunters, especially during the ritual tribal "hunts of death", were exceedingly efficient killers. Chaka also had to restrict hunting and ensure that the benefits of the ivory accrued to himself – the royal prerogative not unknown in modern Africa.

Analysis of this situation would seem to indicate that in pioneering communities the mere act of regulation or legislation does not ensure protection of the wilderness. The basic principle has also been stated by Aldo Leopold in his 1925 message to the United States of America: "Our tendency is not to call things resources until the supply runs short. When the end of the supply is in sight, we discover that the thing is valuable. The next resource is . . . wilderness."

This does not mean that the legislator has no significant part to play. One need only consider that day in 1903 when John Muir made Theodore Roosevelt sleep in the snow of Mariposa Grove and the President exclaimed: "The grandest day of my life!" The outcome was the setting aside of five national parks, sixteen national monuments and 148 million acres of national forest.

Muir's propaganda technique was to sell the idea, with an empathy that went to the deepest levels of his being, to a powerful man who could put it to practical use. In the spring of 1935 Dr. Hugh Bennett, the father of American soil conservation, found himself in a Mariposa Grove of his own – room 333 in the Senate Office Building where he was arguing the case for the setting up of the Soil Conservation Service. The sales resistance from the politicians was overcome only when an unexpected dust cloud of wind erosion on the Great Plains darkened the Washington sun. So the seventy-fourth Congress passed forthwith Public Law 46, the first soil conservation act in the history of America or any other nation.

The argument is not that one should wait for omens in seeking new wilderness areas or protecting those that have already been proclaimed. The incidents of John Muir and Hugh Bennett simply illustrate the need for conservationists to have at their disposal leaders who can face the politicians and talk to them in their own language. When they are given the facts, there is always the possibility that the more idealistic men might take action in the national interest or to protect a regional economy.

This was the case with the proclamation of the Sabie Game Reserve on 26 March 1898. The minutes of the Transvaal Volksraad, the people's council, revealed that the hidden persuader was R.K. Loveday, an English-speaking representative from the Barberton goldfields, who had the idea and found an attentive ear when he suggested it to Paul Kruger, the State President. There are many who consider that in some respects Loveday was the true father of the Kruger National Park which grew out of the Sabie Game Reserve. But as so often happens, the donor of the idea receives less credit than the reputed father who officiates at the baptismal font. It is a familiar event in the sphere of water conservation, when the engineers who planned the magnificent dams are forgotten the day the sluice gates are opened. On the other hand, it is also a subtle bribe which dam builders may use when they promise a politician immortality in concrete by naming the structure after him.

Another South African hidden persuader of nature conservation was Dr. I.B. Pole Evans, who found a ready ally in General Smuts for his plan to establish the Dongola Reserve south of the Limpopo River. With Rhodesia and Botswana also donating land, this sub-tropical thorn-tree desert would have been large enough to encompass a natural ecosystem – the biggest wilderness area in Africa, where scientists could watch evolutionary forces at work. Parliament proclaimed the reserve in 1946, but two years later there was a change of government and the reserve was de-proclaimed. Nature conservationists regard it as an act of political assassination which was perpetrated by cattle ranchers who wanted the land and used their votes as a weapon. Today this sub-marginal area is deteriorating rapidly. Cynics assert that

the grazing per head of stock is so large that camel patrols are needed to round them up.

We must reconcile ourselves to the fact that there is no power in a modern democratic society – or in a socialist state, for that matter – which can protect a wilderness area from a change of government. It could not happen if there was a strong public opinion in favour of its retention, but the collective mood of the voters, which is the loadstone of the politician, can change.

In 1970 there was a time of great environmental awakening in the United States and within a year the Administration and Congress had developed institutions capable of dealing with ecological problems in a systematic way. I refer to the establishment of the Council of Environmental Quality and the Environmental Protection Agency. But in the meantime one senses that the mood has been changing. The forces which desire unfettered progress, believing that science can find methods of more effective use for dwindling resources, have counter-attacked with vigour and skill. America-watchers on continents that still have an abundant supply of raw materials have been studying with some concern the actions of a nation whose industry and prosperity enables it to use up almost two-thirds of the planet's non-renewable natural resources. They realize that America's most pressing environmental issue is land-use control and when the country fails to take effective measures there is a fear that this mighty power will come to mine and remove the riches of other countries.

I have given these examples of the interplay of politics and the ideals of conservationists to pose the question: what action can the environmentalist take to inform and persuade those who, by enacting legislation, can put his ideas into practice? Obviously, it is not in the nature of his function, nor has he the aptitude and training, to attempt to supplant the politician in his own arena of decision-making. But I would suggest that there are two main lines of action that are compatible with his interests and ability.

In the first place, the activities of numerous outdoor societies must not be restricted to the sphere of their specialized interest such as rocks, wild flowers, trees, birds, butterflies, shells, game. They must be more effectively guided in the task of shaping the cultural attitudes of the society in which they operate. As Arnold Toynbee asserts in *Mankind and Mother Earth* this cultural adaptation is the only guarantee that mankind will survive on finite resources. The millions of nature lovers must come to realize that they are not mere observers and collectors, but a potential world force that should be filled with missionary zeal.

There are numerous international bodies which have worked for the creation of this emotional attitude, this unity of ideal and purpose, in the ranks of their followers. But the limiting factor has always been the lack of a propaganda plan that would synthesize their ideas – that would make it whole, readily understandable and an inspiring call to action. They have been like a religious movement without a book, a creed, a slogan and a symbol. Their prophets have spoken with too many tongues and there has not been a master to tell them in three words what road to take.

I regard the formulation of such a plan as the greatest task awaiting the

environmentalists – especially those who desire the retention and extension of wilderness areas like arable land or grazing which are not protected by the need for optimum food production. In looking for such a plan, we are not groping in the dark corridors of persuasion. Ever since Serge Chakotin published his study of modern propaganda – which H.G. Wells regarded as the most significant book of the twentieth century – his pyramid of socio-psychological forces which form the essential structure of all valid and viable campaigns has been the guideline for professionals who have put it into practice. Its design can be found in the structure and functioning of all the great religions and also in the opposing forces, the methods used by Nazism and Marxist-Leninism.

At the base of the pyramid there is the myth and the book, the Bible of Christianity or the Koran of Islam – and it may be the creation of many men, or prophets and apostles, through the ages. The wilderness ideal has a library of such works. I mention again the works of Thoreau and John Muir, but there is not one work which embodies the essential aspects of the history and beliefs on which it is founded. Such a book is needed. It is not essential for it to be a work of original genius, but, like the Bible itself, it can be a compilation from the great wealth of inspired material that is available.

The creed – like the Nicene creed which is the formal statement of Christian belief – can be drafted by a council of experts if we are fortunate enough to have a scholar who is able to extract the essence of the book.

But there is no substitute for genius, the flash of inspiration, in writing the words of the slogan and designing the symbol in such a manner that they will be the ultimate synthesis of the collective unconscious. It is true that the cross, which was not used as a symbol before 900 A.D., grew out of the myth. The golden autumn leaf of the erythrina tree, which has many historical associations in South Africa, has been chosen as a non-aggressive symbol by the Wilderness Leadership School and it is yet to be seen whether this can acquire sufficient empathy to give it meaning and inspiration. That would have to precede the acceptance of the suggested slogan, which has the ring of a biblical command: "Take this leaf." However, if leaves from suitable trees in other regions are selected, there is the danger that the element of universality will be lost. This is a world movement. People from every continent and country must respond to the symbol and the call.

Since I have been trained to the idea that the object of all propaganda is to initiate action, may I, in all humility, appeal for the implementation of a plan such as I have suggested so that those who love the wild places of this earth may be served by their own book, their creed, their call to action and their symbol.

"The Trail We Follow" is in the nature of the creed of the Wilderness Leadership School. Part of it states:

"We believe that the youthful leaders of today, mankind's most precious natural resource, can be strengthened in spirit, mind and character by a wilderness experience which assists them to orientate their personalities to the great whole, the total environment, by an awareness of Nature's processes in the cycle of life that determines the fate of all living things; that the wilderness will derive bene-

fit from the labours of these leaders when they endeavour to assist the conservation of the natural environment; and that the quality of the city environment will be enhanced for those who live and work there by leadership inspired by the ideal of designing with nature.”

It is from such dreams and ideals that the better world of the future may be designed.

Wilderness and Hunting in New Zealand

JOHN MURPHY

New Zealand, isolated in the central south Pacific ocean, is a small land by world standards. It has a total land area of 269 000 square kilometres and a very long coastline (1 500 km) in proportion to its area; no part of New Zealand is any more than 110 km from a coastline. The population of the country is just over three million.

Its mountainous nature is one of its most striking physical characteristics and less than one quarter of the land lies below the 200 metre contour. There are more than 220 named peaks of 2 300 metres or more, 20 of which exceed 3 000 metres.

There are many other natural attractions associated with mountainous country – glaciers and fjords together with an abundance of thermal wonders in steam fields, boiling mud pools and streams and active volcanoes.

Originally the country was heavily bushed, but in the short space of 150 years man's demands have reduced the cover to such an extent that only 23 per cent of the land area now remains in native forest. Exotic plantations, state and private, amount to three quarter of a million hectares, or about one eighth of the indigenous forest total (less than 3 per cent of the land area).

However, large areas of indigenous forest which have a vast potential for public recreation and enjoyment are set aside in state forests and other lands of the Crown. The largest of these areas are in national parks and state forests.

The two major land controlling authorities in New Zealand are the Lands and Survey Department and the Forest Service.

The Lands Department has the responsibility for unoccupied lands of the Crown, scenic reserves and national parks. The Forest Service controls forested lands and forest parks.

There are ten national parks with a total area of 2 165 240 hectares. They are:

	Hectares		Hectares
Urewera	205 852	Arthur's Pass	69 957
Egmont	33 529	Mount Cook	98 402
Tongariro	75 248	Westland	88 608
Abel Tasman	20 648	Mount Aspiring	287 206
Nelson Lakes	57 442	Fiordland	1 228 348

The National Parks Act 1952, provides for national parks to be established to preserve in perpetuity areas of New Zealand with such outstanding scenic qualities of natural features that their preservation is in the national interest. However, in the early national park formative years the criteria for national

parcs appeared to be on the basis of "if it's mountainous and useless for anything else make it a national park." Fortunately such mountainous and "useless" areas were also those of outstanding natural beauty and wild characteristics.

Forest parks are areas of state forest land set aside for "the purpose of facilitating public recreation and the enjoyment by the public." Current policy is to maintain large areas predominantly in their natural condition but with provision for tracks, bridges and huts for public access and safety and also to recognize some areas in the forest parks as wilderness without any of the mentioned developments. The first forest park was created just over ten years ago and they have now grown in number to fifteen covering 1 180 154 hectares. They are:

	Hectares		Hectares
Pirongia	14 192	Rimutaka	14 085
Coromandel	67 746	Haurangi	15 148
Kaimai-Mamaku	37 141	NW Nelson	372 057
Whakarewarewa	3 830	Mount Richmond	175 751
Kaweka	64 606	Lake Sumner	73 895
Kaimanawa	74 845	Craigieburn	4 452
Ruahine	90 174	Catlins	56 557
Tararua	115 675		

The first national park, Tongariro, was established in New Zealand in 1887. After an early rush to create national parks the momentum was lost and only one new national park has been created in the last twenty years.

Ironically it has been the Forest Service which is primarily a production orientated service, that has responded to public pressures and requirements and has rapidly set up, added to and enlarged a forest park system. This surge of designation and promotion of the forest park system brought a mad scramble by the Lands Department in 1976 to assess potential for additions to the national park system. No further new national parks have been created since that scramble. There is now, obviously, a degree of competitiveness between the two departments to hold or gain control over the lands. If it does no more than strengthen the determination of those two departments to hold their wild lands in a natural state then the rivalry will have served a useful purpose.

Both the National Parks Act and the Forests Act include definitions of the wilderness resource as follows:

National Parks

- (a) It shall be kept and maintained in a state of nature.
- (b) No building of any description or ski tows or other apparatus shall be constructed thereon.
- (c) No horses or other animals or vehicles of any description shall be allowed to be taken onto or used on the area.
- (d) No roads, tracks, or trails shall be constructed on the area except such foot tracks for the use of persons entering the park on foot as the Board deems necessary or desirable.



The red deer (Cervus elaphus) is the most common of the seven different species of introduced deer found in New Zealand today.

State Forest (includes forest parks)

- (a) It shall be kept and maintained in, or allowed to revert to, a state of nature.
- (b) No buildings of any description or ski tows or other apparatus shall be erected or constructed thereon.
- (c) No animals or vehicles of any description shall be allowed to be taken onto or used on the area.
- (d) No roads, tracks, or trails shall be constructed on the area.

In practice the wilderness area definition in national parks is rigorously applied to recreational users who are not allowed to use helicopter or floatplane transport for access, but not to commercial helicopter hunters who are granted permission to continuously hunt wilderness areas and who in one area have made substantial cash donations to the park concerned.

There are few gazetted wilderness areas in our national parks, forest parks or state forest lands at present. They number ten and cover a total area of 275 041 hectares.

National Park Wilderness Areas

<i>Park</i>		<i>Hectares</i>
Tongariro	Te Tatau – Pounamu	6 475
	Hauhungataki	8 498
Arthurs Pass	Otehake	12 100
Fiordland	Glaisnock	124 800
	Pembroke	18 000

Forest Park Wilderness Areas

<i>Park</i>	<i>Hectares</i>
Kaimai-Mamaku (2 areas)	3 763
Kaweka	8 000
Ruahine	13 600
Tararua	20 278
North West Nelson	59 500

Recreational user groups have stipulated fairly basic wilderness resource minimum requirements.

Federated Mountain Clubs

- (a) Unmodified by man.
- (b) Capable of providing solitude and primitive recreation.
- (c) Should be of a minimum size (suggested minimum of two days travel across by foot) with an adequate buffer zone.

N.Z. Deerstalkers Assn.

- (a) Should be those areas whose character is determined by purely natural processes.
- (b) Should be areas which are large enough and so situated as to be unaffected by what takes place around them.
- (c) No huts, tracking or modification by man, access by foot only.

These two groups comprise the traditional bush and mountainlands user. General public definition appears to be simply one of "a place in the bush, quiet, and away from it all."

New Zealand is a tame country. Habitually it starts work at nine a.m. and ceases at five p.m. five days a week. It is well organized and civilized. Because of this tameness and "day to come" predictability, New Zealanders throw themselves into many sporting activities – most of them into the organized type of team sport; but many others, seeking to satisfy their need for challenge and excitement – so lacking in today's society – retreat to the hills and bush to climb, explore, hunt and to meet nature under its conditions. We are a nation of outdoors men. As an indication there are approximately 700 000 sporting firearms in the country – almost as many as the number of television sets. Rugby is not our only national sport; we have another, and it has an official title "search and rescue". Every weekend and also throughout the week, our outdoors men, trampers, hunters and mountaineers volunteer quickly when an emergency arises and freely give of their time and experience, not merely to help their fellow man or even to guarantee insurance should they ever become a victim in the future, but increasingly to satisfy their own inner needs to meet a challenge and hopefully win under adverse conditions.

These same men are also the ones who appreciate and need the traditional type of wilderness experience. They are also the ones who very quickly recognized the threats to natural areas and who have led the fights to save and hold what we have. They are of course not the only ones who have a need to experience the benefits of wilderness.

I agree with the Wildland Research Centre (U.S. 1962) that a wilderness

experience is "a state of mind" and with Stephen Spurr who wrote that "every man has his own concept of wilderness."

Generally, the outdoor mountain-users with whom I have the most contact state that the wilderness resource definitions above are the basic requirements to enable them to obtain a wilderness experience. Public opinion also appears to be that a wilderness experience is associated with the outdoors, mountains, bush, wildlife and wildness.

The areas legally defined as wilderness are too few in number and area to even come close to satisfying present wilderness experience requirements of the New Zealander. However, most of our wild lands whether national park, forest park, state forest, unoccupied Crown land or even some of our large production forests in their early years are large enough and are capable of providing and satisfying a reasonably true wilderness experience whatever the zoning title may be.

As with the rest of the world New Zealand is experiencing increasing pressures on its wild lands. The country relies almost solely on its primary produce for overseas exports to maintain its balance of payments and consequently its present standard of living. Dependence on this type of activity in recent years has greatly increased the pressure for more land for conventional farming. The remnants of the native forests are being eaten away by milling, clear felling, burning and replacing with the faster growing exotic species of timber. The lands which are usually released to these activities are of course those which have satisfied wilderness requirements in the past.

With so many areas of natural beauty it is little wonder that the country has developed an annual \$200 million dollar tourist industry, and in an attempt to meet the overseas balance of payments deficit the government has announced its intention to make tourism a "first tier industry". Already the implications of this intention are becoming obvious with major proposals of roading and accompanying developments, through national parks, forest parks and state forests. This increased tourism will of course affect the very resources upon which it is based.

There is considerable opposition to these roading proposals. The Nature Conservation Council of New Zealand is one of those groups opposed and it has adopted the conclusion that roads in unroaded or wild areas are likely to bring environmental damage which destroys wilderness qualities. Wilderness cannot survive crowds, and its value cannot be assessed on the volume of usage as future policy.

Traditional wildernesses are being eliminated, often through recreational development or introduced animal control. Recreational representatives have agreed that co-ordination between the major land controlling authorities in New Zealand is essential if the country is to avoid differing sets of wilderness standards. Already the federated mountain clubs of New Zealand have urged the formation of a wilderness commission to oversee the management of our wilderness resource. Detailed proposals for at least sixteen new wilderness areas (seven in the North island, nine in the South island) totalling six per cent of the area of New Zealand have been discussed with the Forest Service and the Lands Department.



Shooting from the air is permitted in New Zealand. There are no seasons or limits on the taking of big game animals. The 'open slather' policy and lack of proper game management plans has resulted in a public outcry from recreational hunters and many other sections of the public which have objected to the continual cruising of helicopter gunships over public parklands, including wilderness areas. The photograph shows one of the gunships uplifting a load of slaughtered deer.

These then are the usual threats to our wild areas and wilderness values – typical threats which New Zealand does not face alone. Indeed most other countries attempting to preserve their own wild areas face exactly the same kind of threats.

New Zealand however has a threat, perhaps all of its own, which has already destroyed, for the last decade and possibly the next also, any chance of true wilderness experience for those in the country seeking it.

The mountain and bush wilderness values have been devastated by a situation which has allowed and even encouraged helicopter gunships to cruise and operate over all of our wild lands with very little control. To understand how this situation arose we need to look at the history of game animals in New Zealand.

Before human habitation the country had only two land mammals; both were a small type of bat, and a considerable number of birds. Many of the birds were ground-dwelling species, some of which (moas) were of considerable size standing up to ten feet tall. The first settlers, Polynesians from the Pacific Islands, brought with them rats and dogs and soon hunted the several species of large birds to extinction.

Early European explorers liberated goats, pigs and sheep and subsequent European settlers, from 1850 onwards, introduced the usual farm animals and several species of game animals. Amongst these game animal introductions were fallow, sika, whitetail, sambar, rusa and red deer and wapiti, moose, thar, chamois, wallabies and the Australian opossum.

A New Zealand bush without any other competing grazing or browsing animals, an absence of any type of natural predator, protective legislation and a very small human population, presented ideal conditions for the animals. Some of the introduced species responded in a spectacular manner and by the 1930s presented such a problem that all protection was removed from them. Various control operations against the animals by the Government failed to significantly reduce the numbers of animals.

Legislation was passed which declared all the introduced game species as "noxious". The legislation provided that the animals described could be taken by anyone, any time and by any means.

In 1960 recreational interest in hunting greatly increased and there was more leisure time to pursue such activities, and a realization that such a wildlife resource could also be commercially exploited with little restraint. The public's attitude to the tag "noxious" started to change and they began to accept that the game animals did have a value – commercial and recreational.

The legislation did not change. Because it did not keep up with the circumstances and allowed the "noxious" animals tag to remain, the scene was set for an outbreak of lawlessness which the New Zealand backcountry had never before witnessed. With the increased competition for the animals, from both commercial and recreational users, animal numbers dropped dramatically and subsequently commercial prices for carcasses increased.

Helicopter gunships, which were simply flying shooting platforms and recovery vehicles, were encouraged by the higher prices to range further afield for lower tallies and in pursuing their objective were quite prepared to disregard the rights of any other individuals whether sportsmen, farmers or recreationalists. Penalties for breaking civil aviation regulations were paltry and were regarded as no more than a small fee which occasionally had to be paid. Inevitably some of the operators became so greedy that they started to fight amongst themselves. The situation became so serious and they so infringed the rights of other park-users that the Government was forced to intervene and order airforce patrols to keep the peace.

All the following facts have failed to remove the legal definition of "noxious" from any of our wild game animals.

- Greatly reduced numbers of game animals (estimated by Forest Service to be a ninety per cent reduction of the original population);
- An increased need by over 35 000 recreational big game hunters;
- Increased commercial values of the animals;
- The discovery that some of the wallabies originally introduced from Australia are now world endangered species;
- The recognition of the value of important surviving repositories of genes

of rare breeds located among some of the untainted remnants of wild goats and sheep on off-shore islands;

- The fact that some of the species on the "noxious" animals list can no longer be found in New Zealand.

Of course, the affected groups have gone through the usual procedures of petitions and submissions to select committees but have not met with any notable success.

It is easy to walk into the bush and get away from buildings, cars, pressures and pollution and to seek, and if found enjoy, the benefits of those many values of wilderness which can be so different for each of us. In New Zealand it is not easy to find that wilderness which we seek. Time after time it is destroyed by a single marauding helicopter gunship. The loss of wilderness experience will continue until the introduction of legislation to control the meat-recovery industry and the removal of the tag of "noxious" from our game animals.

Wilderness and Black Education

DR SUE HART

To most of us wilderness is a need, a deep interest, a passionate involvement, an inspiration, a life-line to sanity, to serenity.

If ever man has had a need for renewal and solace, for the peace and healing quality of nature's wilderness, then it is now, today, for we live in an era when our very survival is threatened by the continuous, relentless onslaught of negative force.

If this is so, if we really feel this way, if we do not want to see wilderness die before our very eyes, then we must not commit the grave error of forgetting those millions – and I am thinking especially of the black youth of our country – to whom wilderness is not a friend but a stranger, an unattainable, remote vastness filled with things unknown.

It matters little whether we seek the wilderness because of economic, social, scientific, emotional or spiritual reasons; what does matter is that we face the fact that our wild regions cannot be retained if future generations do not understand the need for the preservation of their natural environment.

This surely is the focus of our problem; if we do not find the means of reaching the majority who have never had the opportunity of discovering the wonder of nature's creation, then every part, every square kilometre of our beloved wilderness will be lost to us. It is the youth of our land who must take their place as the custodians of the wild.

Our wilderness is in dire jeopardy. We are moving too slowly without sufficient direction or co-ordination, and yet we know that we live in a time when speed and efficiency of communication, when the implementation of conservation awareness teaching, should be our prime concern.

Since only a relatively small number of black students and scholars can ever get into the wild, can ever be taken out on trail, we must find the best means of bringing the wilderness to them . . . right into their homes, their clubs, their schoolrooms, their everyday lives.

So very little has as yet been achieved in southern Africa in wildlife education or awareness training, so little that we must work very hard to make up for lost time which is possible only if those who think of themselves as conservationists – and I appeal not only to those in Africa but the world over – will support what began only a few years ago and is still in the developing stage.

The Wilderness Leadership School has conducted some trails for blacks in Zululand. The Wildlife Society conducts a regular teacher training course in KwaZulu under the able guidance of Ian Garland and Simeon Gcumisa, a programme which during 1972 put fifty-two teachers through their nature conservation paces. Obviously, black teacher training must rate very high in

our list of priorities and will, we hope, be expanded on a national basis in the near future.

The question is often asked: is it really possible to kindle genuine continuing enthusiasm and interest of nature in individuals who have already become deeply engrained with city ways and city values? Can a city-polluted mind be awakened to the simplicity, the freshness, the wonder of nature's realm? The answer is yes, provided nature trails or schools' programmes are presented under the guidance of experts who know how to kindle and re-establish a link with what, after all, are our most basic roots.

The following letter, from a seventeen-year old black city student, B.P. Kumalo, demonstrates his renewal of kinship with nature. It came about because he was given the opportunity to spend time on a nature trail:

"For sixteen years I've walked with eyes closed whereas I thought they were wide open. I've been to places like Zululand, learnt how to look after cattle, look for wood and how to fetch water, but all this must have happened automatically because I benefited nothing out of it.

"If I were to tell everything I saw, heard or learnt about in Umgeni valley, it would be very difficult because there are many things we came across. I will tell of some things which most struck me.

"We looked at trees in a different light. We were taught their names and adaptation and were told everything about them in terms of ecology. When our forefathers carried out their traditional customs, they used these trees. Some of us had already forgotten about them. I, for instance, was in Zululand in June. There would be an unveiling of a tombstone of my grandfather. I heard my father saying that they were going to fetch my grandfather's spirit. Somehow I did not understand because I was too ignorant to notice what they really did, but I learnt later that the tree, *umphafa*, was used.

"This visit has really increased my knowledge about nature and, above all, I've enjoyed myself. People like me who live in townships rarely have these opportunities of seeing and learning about these things. Thanks to the Wildlife Society and their good, patient teachers, now I enjoy sitting down and looking at grass, trees, or when the sun sets, I become worried if I see erosion . . ."

When audiovisual techniques are employed – our most valuable media for extending conservation training to young people in large numbers – it is of the utmost importance that the scholars feel included and involved in what is before them, that they should be made to feel that this is their environment, their wilderness, their wildlife and eventually also their responsibility. They should feel spontaneous empathy, not only with the wild, but with those who introduce the subject to them. Wildlife school courses should be adventures, rather than lessons, something to look forward to eagerly each week, each term.

While I was in East Africa, I explored different channels of wildlife education, eventually employing a method which successfully bridged the gap between programme participants and audience – a gap which often prevents programme content being absorbed or enjoyed.

Within my "Animal Ark" series I implemented a spontaneous dialogue technique so that viewers could identify and link with those on screen or on radio, becoming totally involved in the bush episode enacted before them.

If dialogue productions of this type are to be used in schools, it is essen-

tial to realize that teachers may have little more knowledge of wildlife than their pupils. Hence well-illustrated handbooks, collateral to audio or visual courses must be provided, must be studied and used as pre-conditioning for programmes to come.

The success or otherwise of such a project entails regular communication with teachers or heads of the schools and, if possible, close contact with the pupils actually experiencing these courses. It is essential that schools' programmes follow a simple, spontaneous format, each session not exceeding fifteen to twenty minutes.

In this way we can avail ourselves of a unique opportunity of introducing the pupil to the magic of wilderness; once the interest has been kindled, less colourful though just as essential material dealing with other aspects of the environment can be presented in a similar way, step by step, term by term.

A film entitled "Our Wilderness", the first – we hope – of a series – demonstrates what can be done, what the Wildlife Society of Southern Africa is doing to fill this need. It has been produced and directed by the Chamber of Mines film production unit, filmed at Umfolozi Game Reserve with kind permission of the Natal Parks Board and the staff of Umfolozi Game Reserve.

When I wrote the story and then the shooting script I introduced two characters: a black ranger dedicated to wilderness and a city schoolboy who has never been in the wilds.

In all close-contact dialogue series, maximum exploitation of living sound plays an important part in gaining attention and awareness. Awareness leads to a sense of involvement, of protectiveness and an urge to quest fur-

The film team at work on the film: OUR WILDERNESS in Zululand.



ther, to find out yet more and so, perhaps, another much needed conservationist may have been launched. The magic of the bush is irresistible and especially the sounds of the bush, so to someone who has never really known how to listen, to look, here lies the most fascinating study; animal communication opens up a new world, a new dimension.

I should like to end with the words of the ranger; at the end of the day, round the fire. The boy is very tired, he has come a long way and yet he listens intently for suddenly his guide's words have taken on a new importance, a new meaning.

Game Ranger: It's up to us – to you – to see that our children, and their children after them, will see the rhino and giraffe and lions in the wild. We, the custodians, must guard our wild places where the animals, birds and insects live as they have always lived. We too, you and I, are part of nature – part of wilderness.

Educating the Decision Makers or Rhodesia's Wildlife Conservation

MICHAEL V. GARDNER

In Rhodesia nearly 45 000 square kilometers are set aside as parks and wildlife land. This is over eleven per cent of the land surface, a percentage that compares very favourably with countries in Africa and elsewhere.

The legislation affecting the parks and wildlife estate is progressive, far-sighted and far-reaching. The estate is classified as national parks, botanical reserves, sanctuaries, safari and recreational areas, and each one of these is managed in accordance with a policy document which identifies within a particular park or reserve the wilderness areas, wild areas and the development areas, and other levels of land usage.

There is no separate legislation for the wilderness alone. Its designation and management are encompassed within the Parks and Wildlife Act.

In deciding the best uses for land within the estate, our department of national parks and wildlife management has taken into account both the intrinsic natural values of the areas and the needs of the people who will be visiting and enjoying them. This may sound a little obvious but I believe that there are far too many park systems throughout the world where the potential for satisfying the needs of visitors is available but is not developed and offered to the public. And this can be done without causing problems.

Naturally the needs of the visitor are as varied as humanity itself so one cannot provide for them all. But our park system has been very successful from this one point of view in that it has attempted to satisfy a wide variety of wilderness experience expectations amongst the greater majority of the public. In so doing it has not lowered the basic nature or the values of the wildlife areas, but on the contrary I believe that they have been enhanced.

All those who are charged with the management of wilderness should remember the words of Max Nicholson, author of *The Environmental Revolution*. He said: "Nature can produce the raw material of scenery unaided, but even natural scenery exists only when man appreciates it. A natural environment only becomes a piece of beautiful landscape when it is so regarded by mature people."

The man-made facilities in Rhodesian wildlife estate are almost without equal in Africa and there are sufficient quantity and variety to cope with the demands of a normally increasing market until at least the end of this century. Of course if the market continues to remain static or even to decrease, we could cope for ever!

In short, Rhodesia has wilderness, good wilderness; it is protected by legislation, very good legislation; it is available to those who seek to experience it; the experiences are of the highest quality.

Outwardly this is a happy situation which should not cause concern. But

there are many of us who fear for the future of our wildlife estate and the reasons for our fears are not necessarily new ones.

I am no politician, nor am I a crystal ball gazer, but I must assume that within the near future the hierarchy of power within Rhodesia will alter. I cannot comment on the implications of this change except as they may affect wilderness.

We have been assured that an acceptable settlement in Rhodesia will carry with it a large sum of money amounting to several hundred million rands and earmarked for development projects within the country. The scope of these developments is not yet known but it seems most probable that most of the funds will be channelled into African agricultural schemes, education and certainly into industrial development, taking into account the enormous natural and human resources available for exploitation. I use the word exploitation advisedly because I would like exploitation to take place within the best possible interpretation of the word. But the word also carries a connotation of abuse and over-development and this is what constitutes the real threat.

Peasant agriculture certainly needs assistance but its problems will not be solved only with foreign financial aid. It is a problem of historical attitudes towards the land, crops and cattle, and also towards the wild areas and wild animals that exist adjacent to the human settlements.

Population is a recurring subject and Rhodesia does not escape the problem. In fact the population growth in Rhodesia is the highest in Africa – a silent tribute perhaps to the high standard of social and medical services and other conditions which, being basically stable, encourage its growth.

Unless the development capital for agriculture is used very wisely it will produce no long-term benefits and will only aggravate and hasten the onset of the population and resources conflict.

Industrial development may be an enterprise of even more severe impact on wildlife areas and I am particularly concerned about the possibility of a string of hydro-electric schemes on the Zambezi River. The general manager of the Central African Power Corporation said at a symposium in Pretoria recently that Kariba Dam represents only a quarter of the power potential of the Zambezi River between Rhodesia and Zambia.

He said that five more hydro-electric projects could be built on the Zambezi River. These would range from above Victoria Falls to the upper limits of Caborra Bassa and would effectively destroy what is left of the natural flow of this beautiful river together with the flood plains and riverine forests of the Mana Pools area between Kariba and Caborra Bassa.

All the preconditions necessary for fulfilling these projects will be satisfied. Knowhow, international co-operation, finance and of course the very necessary statement from a Government minister which will say: "This is in the national interest to meet the needs of our people." All the legislation in the world and all the voices of a concerned public will never afford protection when that phrase "in the national interest" is used.

One aspect of human activity which can reach deeply into and cause harm to the natural environment is the industry of tourism.

Up to now we have made comparatively few mistakes in the development of tourist amenities in sensitive natural environments or in the ways in which we have allowed visitors to use these areas. The threat of heavy pressure from tourists which was building up in the early seventies did not materialize and we have been given valuable breathing space. This may not last, however, and given a political settlement and freedom to market our tourist product once again throughout the world I would predict an early return to these pressure situations. Once again we may see a scramble for new development sites, as international finance should be quick to realize the vast potential of the superb natural product that Rhodesia has to offer.

What I fear are unnecessary and unscrupulous developments on islands, river banks and in other special sensitive areas. Once again all the existing protective legislation will not be able to stand against the personal aspirations of some Government minister.

Despite these gloomy predictions I am not a pessimist. To be pessimistic is to have given up already and to have accepted the inevitability of wilderness destruction. In Rhodesia today there is no room for pessimists anyway. But, what are some of the solutions?

I would hope that some of the development funds will be devoted directly to conservation as there are many projects which could be embarked on with additional funds. It is a matter of some pride to Rhodesians when I say that what we have today and what we have achieved – which is by no means inconsiderable – has been achieved from our own resources. We have not, for over a decade, benefited from many of the handouts which appear to be one of the privileges of membership of the Third World. But we could certainly make good use of any future handouts.

Large-scale conservation education is important but this in itself will not solve our particular problems in the short term. The conservation education scheme at Mushandike has been in existence for some years although it is at present temporarily closed. A great deal of money is spent by many branches of Government by the Conservation Trust, the Natural Resources Board, local conservation committees, the Wildlife Society and others, but it is far from sufficient.

I believe that conservation education is done for two reasons. One is to create that well-informed body of public opinion which can be rallied in times of crisis, which is a reason with an ulterior motive; and the other is quite simply because a renewed contact between people and nature must make us into finer people, which is probably the better reason.

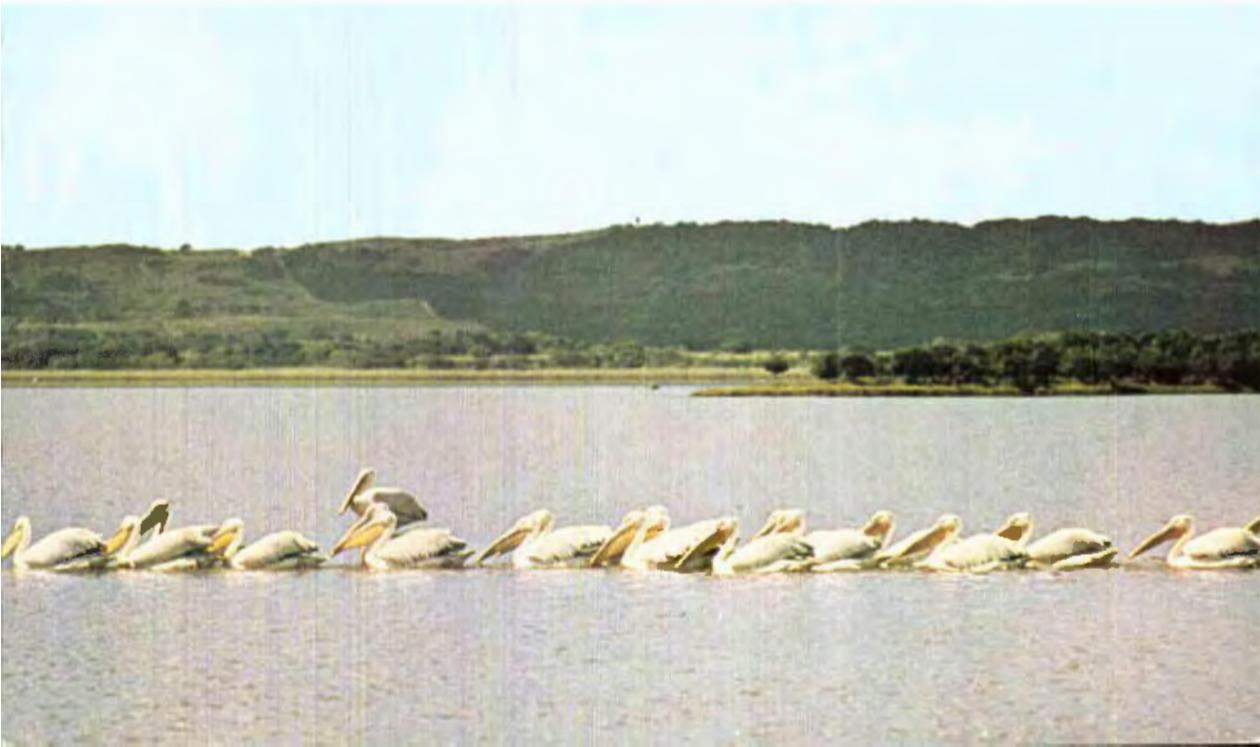
This work must go on and it must be intensified. But our problem is the education of the decision makers. Unless that is done soon, we will lose on many fronts. Our problem, however, is to know exactly who the decision makers are going to be and how they are going to react to a subject which regrettably is very alien to most of them.

My mind would be easier if I could picture just one existing Rhodesian white minister or potential black minister who spoke about wilderness with the personal conviction that underlies Dr. Piet Koornhof's statements on the subject. Of course my mind would be easier still if there were ministers,



△ Elephants in the Kruger National Park, South Africa. Over half the elephant population of Africa may become extinct within the next five to ten years.

Pelicans at St. Lucia, Natal ▽





△ Martial Eagle

▽ In some wilderness areas in East Africa increases in waterbuck are evident as heavy bush encroaches on eroded rangelands.



other than those whose portfolios make it essential that they know something about wilderness, who could speak with similar knowledge and personal enthusiasm.

Tourism also has its part to play in planning the future development of facilities and in shaping the quantity and the quality of the market which will use wildlife areas.

Max Nicholson said:

"While many people may dream at times of being provided with instant wilderness, into which they may be comfortably jet propelled ready to alight and immediately drink in its essence at a gulp – the truth is not like that.

"Those that cannot through long preparation and through contributing a satisfying personal effort come to wilderness in the right frame of mind to appreciate it, could mostly do better to stay away and see it by means of films or through good and well-illustrated books, or alternatively, through getting to know well some substitute wilderness near enough to home to be visited often enough and long enough for some degree of familiarity to be achieved with it."

The appreciation of natural beauty is not instinctive in humans. It needs to be learned and developed and in many ways this is the function of an intelligent tourism marketing approach. I feel very strongly about the fact that those who can afford to visit the true wilderness are not necessarily those best able to appreciate it. Wealth alone cannot endow a person with the ability to appreciate and derive satisfaction from wilderness.

I personally reject the call of the so-called hungry nations of this world who seek to take over that last remaining eight, nine, ten or eleven per cent of our countries which is set aside for conservation. Adding this land to what they already have will not solve their hunger. It is like that rhetorical question which is so often asked, "How can the Vatican continue to keep so many millions of dollars worth of precious art when there are starving people throughout the world?" The answer is simple. The Vatican treasures, like our wilderness, may feed them all for a very short time and then they will be hungry again and we will have no more treasures.

Sir Peter Scott takes an optimistic view when he says: "I believe that sooner or later man will learn to limit his over-population. That he will become much more widely concerned with optimum rather than maximum; quality rather than quantity; and will re-discover the need within himself for contact with wilderness and wild nature."

But we will need many many more Grey Owls to help us.

The Conservation of Wilderness in Thailand

DR BOONSONG LEKAGUL, M.D. and
JEFFREY A. MCNEELY

The fact that delegates to the World Wilderness Congress in 1977 came from all parts of the globe to meet in South Africa is a good illustration that the world is now a single unit – and this is why wilderness is being destroyed in Thailand. How this is so, why it is a problem, and how it can be overcome, are the subjects of this paper. Each of these subjects will be discussed as answers to questions: Why is wilderness threatened in Thailand? Why should wilderness be conserved? How can wilderness be conserved?

It seems to us that the root cause of virtually all modern threats to wilderness is the expansion of the human ecological niche, subsidized by large inputs of energy from non-renewable fossil-fuel resources. Technological advances have made the world into a single all-inclusive ecosystem, so we can have a World Wilderness Congress, a World Bank, a United Nations, a growing body of international laws, treaties, and sanctions, huge multinational corporations, and an enormous international trade. Rapid and cheap transportation has served to open up markets in Japan, Europe, the Middle East, and North America for Thai natural resources, including wildlife, and for cash crops grown in Thailand on previously forested wilderness; without this world market, Thai wilderness would not be nearly so threatened.

In man's "pre-industrial niche," wilderness and wildlife were conserved by traditional means, including relatively closed human ecosystems, religious and cultural sanctions, primitive weapons, lack of cash markets, concentrations of human populations in relatively small areas of the most suitable agricultural lands, remoteness of the remaining wilderness, and the adaptation of wildlife to the traditional human ecosystems (particularly shifting cultivation). These traditional means of conservation are no longer effective in an age of modern technology which is spreading into even the most remote areas with roads, dams, firearms, chainsaws, material incentives, flashlights, mistnets, personal mobility, bulldozers, and new value systems. Modern technology allows man to grow more food and harvest more of nature's capital, leading to an increasing population which in turn puts more pressure on the remaining resources, including wildlife and wilderness.

Certainly, man's effect on wilderness is nothing new, and it may be informative to briefly summarize the history of the human niche in Thailand. The first great anthropogenic change in wilderness probably began about half a million years ago, with the development of the use of fire as a hunting aid. Along with the development of improved hunting and gathering tools and methods, fire must have significantly enlarged the ecological niche of pre-*sapiens* man. About 10 000 years ago, with the development of shifting agriculture in the hills of Thailand, man's niche expanded again and he began to settle down into villages, undoubtedly leading to a higher popula-

tion density, at least in the more suitable areas in the hills, the seasonally flooded lowlands remaining excellent habitat for large mammals, and good hunting wilderness for the farmers cultivating the surrounding uplands. Perhaps two thousand years ago in Thailand, there was yet another major expansion with the development of wet rice cultivation; this produced significant crop surpluses in at least the best years, leading to greatly increased population density in the lowlands and to the development of a true civilization with cities, monumental architecture, priesthoods, bureaucracy, and so on. The population of the upland shifting cultivators probably remained relatively constant, roughly at carrying capacity of the land under traditional techniques and cultural constraints.

Starting in about 1850, when the industrial revolution was gathering force in Europe, Thailand began still another basic change in its human ecosystem, becoming part of the world ecosystem through greatly expanded trade. Whereas Thailand's agricultural surpluses in the lowlands were formerly channelled mostly into religion and military within its own ecosystem, foreign trade encouraged Thailand to become a food-exporting country and foreign inputs of water-control technology led to a transformation of the seasonal wetlands into ricelands; the area under rice expanded from about 2.4 million hectares in 1850 to about six million hectares in 1920 and eight million hectares today. With the alteration of wilderness into riceland, the large mammals living in the lowlands became extinct or moved into the hills.

In even more recent times, there has been a great increase in upland cash crops, resulting in the destruction of a great amount of forest of all types. Rubber, for example, now covers about 13 000 square kilometers in the high rainfall zone which was formerly covered in tropical rainforest, an area which is almost equal to all of our wildlife reserves combined and much greater than all of our national parks; nearly all rubber is exported. Other cash crops such as maize, cassava, kenaf, and sugar-cane are all increasing at an incredible rate; the area planted in these upland crops in 1962 was about 6 000 square kilometers but in 1972 the area was 23 000 square kilometers, an increase of nearly four times in just ten years. These crops have increased even more rapidly since 1972, and nearly all of this is for export, and most is at the expense of the forested wilderness.

This brief condensation of half a million years of history has led to the conclusion that if by wilderness we mean virgin forest undisturbed by man, then there is no wilderness remaining in Thailand. Virtually all forest in Thailand has been cleared at one time or another, and most areas have been cleared several times. In the past, most forests in the hills were cleared for shifting cultivation, where a crop was grown for a year or two, the forest soon reclaimed the field, and the large mammals fed on the re-growing forest; the human influence was transitory and even beneficial for the large grazers. But in modern times, market influences have encouraged man to become much more pervasive in his effects, clearing the forest over wide areas rather than in small patches, cultivating for several consecutive years until all soil nutrients are gone, and turning large areas into wastelands.

We estimate that there are no more than 170 000 square kilometers of for-

est remaining in Thailand. In fact, the area of good forested wilderness is much less than this, since we have included large areas of degraded forest lacking most larger forms of wildlife. The rate of forest clearance continues at a rate exceeding 5 000 square kilometers a year, due to logging, shifting cultivation, cash-crop agriculture, and harvesting for firewood (which by itself accounts for over eighty per cent of the wood consumed in Thailand). It can be seen that every four years an area of forest equal to all of our parks and reserves is cleared.

The answer to why we should conserve wilderness is closely related to our answer to the first question. We must realize (however discomfoting the realization may be) that our current way of life, our current ecological niche, can only be transitory because it is based on increasing consumption of decreasing resources, many of which are non-renewable, at least under current methods of exploitation; in an economic analogy, consuming more of nature's capital in the short term means that we will have less of nature's interest in the long term, clearly an unsound strategy. As Dr. J. Terborgh has said, "Some day, of necessity, man must re-establish a steady state with nature. Where on the scale of population this steady state will lie and how we shall arrive there are difficult questions that are being forced upon us with an ever increasing urgency by the accelerated pace of world events. With certainty, the stressful transition period which we are entering now will impose extraordinary pressures on virtually all existing species, not the least our own."

Mankind is thus rapidly approaching a crisis situation; forests are being cleared, soils are being depleted, watersheds are being destroyed, wildlife is being driven to the verge of extinction, the seas are being over-harvested, the human population is exploding, food, water, and energy supplies are dwindling, national economies are increasingly unstable and dangerously interdependent, conflicts are becoming increasingly sophisticated and violent, high-powered weapons are coming into the hands of the general populace . . . the litany of dangers goes on and on. There may be no way to avoid another tragic episode in the process of human history, since only a radical and probably painful change in our niche is likely to bring man back into the necessary balance with his available resources.

If we accept that the future is certain to be quite different from the present, then wilderness conservation should be seen as a vital part of giving man his most productive long-term future. The maximum diversity in nature will give man the widest possible range of responses to the coming stresses, the best opportunities to make ecologically sound local adaptations to locally prevailing environmental conditions.

With the – hopefully temporary – breakdown of traditional wilderness conservation measures, wildlife and wilderness must now be rationally conserved and managed as a resource, applying the same modern technology which is threatening wilderness to the more difficult task of conserving it. Indirectly, modern technology can contribute to wilderness conservation by increasing the agricultural productivity of the best agricultural lands and by improving the productivity of forest plantations, two measures which will

reduce pressure on the wilderness. More directly, modern approaches, including techniques of resource management, can contribute to the maintenance of the system of national parks and reserves which now exists in Thailand, the establishment of special wilderness conservation units, and the control of exploitation of wildlife through national and international legislation. Though considerable effort will be required, it may still be possible for wilderness to play an important role in the human ecosystem over the period of transition to an ecologically sound, steady-state, Thai society.

It might be added that whatever happens in the future, it is quite clear that the current wilderness-destroying episode cannot go on for long, since most forests are being cleared for growing a cash crop which not only depends on a prosperous world market but which can also be cultivated for only a very few years before the soil nutrients are exhausted and the land is abandoned; permanent agriculture will probably never occupy over thirty-five per cent of Thailand, and we can envisage a situation in the future somewhat like northern Cambodia after the fall of Angkor Wat in 1431, where abandoned farmland forms what is probably the best wildlife habitat in south-east Asia for large mammals. Those species of wildlife which are capable of surviving the current extinction forces will probably be able to expand their populations once again, and such generalized, widespread forms as wild pigs, sambar, barking deer, common palm civet, masked palm civet, leopard, jackal, mongoose, black bear, crab-eating macaque, the commensal rodents, and a few others may be quite capable of radiating when "new" habitat becomes available. The "islands" of wilderness scattered across Thailand are perhaps best seen as refuges from which abandoned, destroyed forest can be reclaimed as wilderness by both plants and animals, and the success of our conservation efforts can be directly judged by how many species are able to survive.

There are many other reasons to conserve wilderness for the here and now, but we will confine our further comments to a few reasons of particular importance for Thailand. We will emphasize reasons which may be considered important for land-use planners and government decision makers, showing how their interests converge on those who may be more pure conservationists. These reasons include watershed protection, food production, protection of crops against insects, and habitat for wildlife.

Forested wilderness is particularly important as protection for watersheds in a high-rainfall tropical country like Thailand, especially in view of the very large government investments in the irrigation systems which support our life-blood: rice. Adequate forest cover can protect reservoirs and irrigation systems from siltation, conserve soil, mitigate floods and drought, increase rainfall, and generally increase the productivity of the land. On the other hand, the rapid clearing of forests in recent times has led to recurrent cycles of floods and droughts, increased siltation, and increased erosion.

The wilderness forests can also contribute to food production, using techniques of modern technology. Many of the food plants which are now cultivated in Thailand have wild ancestors in the wilderness; when crossbred with domestic varieties, the new breeds may be more productive than cur-

rently cultivated breeds since they are more likely to have genetic resistance to the various indigenous insects and other pathogens which plague agricultural areas. Among the cultivated plants in Thailand, some which have wild relatives in the wilderness include rice, durian, mango, banana, jackfruit, mangosteen, langsat, rambuttan, sugar-cane, pomelo, pomegranate, taro, tamarind, carambola, hog plum, lesser yam, pigeon pea, cotton, tea, cucumber, ginger, anise, cinnamon, betel-nut, black pepper, cardamon, tumeric, and jute. These plants provide some of the basic raw materials with which plant breeders and geneticists can create the new varieties which will be necessary for changing local conditions.

In the wilderness forests, the trees and other plants are under constant predatory pressure from herbivorous insects; they defend themselves with a wide range of chemical defense mechanisms, many of which are of direct importance to man, or at least could be once they have been recognized and manufactured by modern technology. Rotenone, useful against a wide range of insects but harmless to man and domestic animals, comes from several plants of the genus *derris*, found in Thailand. Pyrethrum (from *chrysanthemum*) is another important natural pesticide found in Thailand, widely used to keep our voracious mosquitoes at bay. There are certainly many other "botanical pesticides" which will prove beneficial to farmers, and these are most likely to be found in the mature forest trees which devote more of their energy budgets to defense rather than growth. It is thus to our benefit to conserve fairly large areas of mature forests where a wide variety of trees survive, and to study these evolutionary laboratories with all the techniques of modern science in order to discover new ways of controlling agricultural pests.

In Thailand, the diversity of forests is also very important as habitat for our very diverse wildlife, including 263 species of mammals and 854 species of birds. Many of these species require rather large areas of forest in order to survive in populations large enough to ensure successful breeding, and many others are confined to the tropical rain-forest wilderness most seriously threatened by competition with human uses (however transitory in the long run). Many of these animals play important roles in seed dispersal and pollination and are essential to the reproduction consequently of many of the forest trees; others are important in predator-prey balance, others help control pests, and all are vital to the functioning of the wilderness ecosystems. Also, and perhaps most importantly from a direct short-term economic perspective, many papers in the World Wilderness Congress have shown that wildlife is important for tourism; and it may become even more important in the future, as urbanism becomes an increasing fact of life and wilderness becomes increasingly rare – and thus more valuable.

It is, therefore, very clear that the forested wilderness areas are vital natural resource systems for Thailand, with many direct and indirect applications to various human problems, in both the short and the long run. And more importantly from a conservation perspective, the forests can be a renewable resource system which, with proper management and protection, can give sustained yields for the indefinite future.

The question of how wilderness can be conserved is the most difficult, and one which all conservationists are trying to answer. Conservation of wilderness in Thailand has been going on for nearly thirty years, and although there have been some successes, the forces of exploitation have proved to be much stronger than the forces of conservation; the philosophy of consumptive materialism is winning over the Buddhist ethic of non-consumption, though there are countries which are much more guilty of this than Thailand. Clearly, nobody has yet produced an answer which is going to convince governments faced with the rising expectations which an increasing population has of immediate material returns.

But despite this very disturbing trend, conservation ideals have had some effect on land-use in Thailand. In 1960, a system of wildlife reserves was started, to which was added the beginning of a system of national parks in 1962. These have greatly expanded over the years, and together the parks and reserves now total 22 588 square kilometers, or 4.39 per cent of the country; several more are planned for the future, and such conservation areas may eventually total about six per cent of our land area.

However, several of these areas have already been destroyed by logging or shifting cultivation, and virtually all are under some sort of pressure around their edges. Further, it seems clear to us that these reserves, while a great step forward from nothing at all, are still too small to really maintain a functioning wilderness. For example, few of our reserves seem to be large enough to hold viable populations of elephants, and when these magnificent beasts wander outside the reserves they inevitably come into conflict with villagers who are usually well-armed and quite willing to use force to protect their crops (even though these may be illegally grown on government land). A similar situation may exist for virtually all our large mammals, who need larger numbers for their survival as genetically viable populations than can be supported by an island of forested reserve. The same may well be true for many forest trees, including some of the rare giants found only every few hundred square kilometers or so. Are we destined to lose these before we can even really appreciate their values?

What is necessary is to have a few much larger areas where the use of the land is controlled for the benefit of wilderness (though perhaps this will need to be re-defined). We have made a first step in this direction by introducing the idea of managed wilderness conservation units.

A wilderness conservation unit (W.C.U.) would not necessarily exclude all human activities, since such an exclusionist approach would be unacceptable to government; and perhaps even more importantly, many forms of wildlife are well adapted to low levels of human influence and actually seem to benefit from certain human activities, including selective logging of mature or over-aged trees, traditional hunting, limited bamboo extraction, and traditional shifting cultivation. Elephants, for example, require about five times the range in mature forests as in secondary forests, since the earlier successional stages of regenerating forest have more of their plant biomass within the reach of the elephants rather than in the canopy. Provided that the human activities are kept within limits which are not destructive of wildlife

populations, and that inviolable core areas remain as national parks and wildlife reserves, such limited use may be the optimal long-term use of the forested wilderness areas in the uplands of Thailand.

We are recommending that two wilderness conservation units be established, one in the Petchabun range in the north-east, the other in the Tenasserim range of western Thailand. Each will contain a core of four already existing national parks or wildlife reserves, with further additions from reserved forest areas. Both wilderness conservation units are very important as watersheds of dams and irrigation projects, and wilderness conservation will add to the longevity of the dams, reservoirs, and irrigation canals in the surrounding areas, as well as create the possibility of controlling land-use more effectively than has been the case. The wilderness conservation units will be zoned for multiple use, retaining current administrative structures in the parks and reserves (where all extractive human activities are banned); however, areas currently outside the parks or reserves will also be managed for conservation of wilderness through a limitation of extractive human exploitation.

An important emphasis of the wilderness conservation units will be the elephants, which require the largest range of any of the Thai mammals. Units which can conserve elephants will also enhance the survival of all other forms living within their range; conservation programmes for each species can be planned, co-ordinated, and funded to the mutual benefit of all and administered as part of a unified ecosystem. Some of the important characters of each wilderness conservation unit are summarized below.

The Petchabun WCU, including some 5 000 square kilometers, is located in the Petchabun mountains of north-east Thailand, forming the watershed boundary between the Chao Phya River (via the Pasak River) and the Mekong (via the Mun and Chi rivers). The proposed WCU stretches from south of Phu Kheo reserve to north of Phu Luang reserve, a distance of about 160 kilometers; the WCU also includes Nam Nao and Phu Kadeung national parks. It is covered in a wide range of forest types, including hill evergreen, dry evergreen, coniferous, mixed deciduous, and dry *dipterocarp*. The unit is bisected by a new road from Chumphae to Lomsak, through Nam Nao National Park; unfortunately, this road is a clear example of the impact of improved communications, with considerable encroachment by squatters growing cash crops all along the road and the many side roads which are also used for illegal extraction of timber. The Chulaporn Dam is within the proposed unit, and the reservoir from the proposed Pa Mong Dam on the Mekong will reach the northern part of the unit. There are many dams in the downstream areas, the most important of which is the Nam Phong. The Petchabun WCU is still rich in wildlife, and includes IUCN-endangered species such as Sumatran rhinoceros, gaur, banteng, tiger, red dog, leopard, and probably clouded leopard. Other species include lar gibbons, macaques, langurs (living in limestone caves), sambar, barking deer, wild pigs, and a wide range of smaller mammals and birds. There are about 200 to 500 elephants, which are known to migrate between the various parks and reserves, though the expansion of maize agriculture in the areas between the

reserves, all on reserved forest land, make it very urgent that these areas be combined as quickly as possible to ensure the viability of the unit.

The Tenasserim WCU, named after the mountain range separating Burma from Thailand, extends from Petchaburi province in the south to Tak province in the north, a distance of roughly 500 kilometers; it covers an area of some 12 000 square kilometers. This area is mostly forested, containing all of the forest types found in the Petchabun WCU, but with drier types dominating; there are wide areas of grasslands or fire-climax savannahs, as well as large areas of bamboo (which are currently being harvested for pulp). This WCU includes Erawan Falls National Park and Huay Kha Khaeng, Salak Phra, and Thung Yai wildlife reserves.

This part of Thailand is famous for its great animal migrations, when elephants, gaur, and rhinos all move into Thailand from Burma during the rainy season and back to the wetter Burmese side with the coming of the dry season. The precise routes of these migrations are poorly known, but at least some elephants move from Burma as far east as Salak Phra, crossing the famous River Kwai above the Chao Nen Dam site. When this dam is completed in 1979, the new reservoir will extend into the centre of the WCU, thus forcing the migrating wildlife to change their routes, but also offering the opportunity for viewing game by boat (as in Periyar Sanctuary in India) and for more efficient access of the wilderness interior. By creating the WCU now, perhaps the improved communication can be prevented from also leading to increased exploitation of the watershed forests. Besides 900 to 1 500 elephants (including seasonal migrants), other IUCN endangered species found in the WCU include Fea's barking deer, banteng, gaur, wild water buffalo (the last remaining in Thailand), red dog, clouded leopard, leopard, tiger, tapir, and perhaps Javan and Sumatran rhinos and Eld's deer. Among other notable species of mammals in the area is Kitti's hog-nosed bat (*craseonycteridae: craseonycteris thonglongyai*, Hill 1974), the most recently described family of mammals and perhaps the smallest mammal in the world, with a weight of 1,7 grams.

While the concept of wilderness conservation units is still in its infancy and needs considerable further development, especially regarding possible administrative structures to control land-use, we hope that such units will receive the government support necessary to prevent extractive exploitation over these rather large areas. We freely admit that this may not be a viable long-term solution, but we take some small comfort in the hope that the problem is only short-term and will last only as long as man's extractive mentality can be subsidized by external efforts. In the long term, nature will take care of herself and man will live in balance with his resources. All we are trying to do as conservationists is to help nature and man have the best means to do so. We believe that this will also be to the long-term benefit of both.

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The National Wildlife Federation at Work

G. RAY ARNETT

The National Wildlife Federation (USA) is dedicated to preserving and protecting the wilderness and to achieving a better understanding and appreciation of the wilderness concept. Our definition of wilderness means all wild or natural areas where the native flora and fauna are preserved. In the United States, the Wilderness Preservation Act of 1964 describes wilderness as "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." Further, it is roadless, undeveloped, and without human habitation. Consequently, some wild or natural areas – parks, forests, and wildlife refuges – cannot qualify under this narrow definition, but we are interested in them nevertheless.

There is a strong thread of similarity between natural areas. In fact, there are those who credit wilderness devotees with the origin of the practice of preserving unique and outstanding areas. The search early in this century by Aldo Leopold, Bob Marshall and others for a system to protect wilderness remnants led to a heightened concern for naturalness which led to the concept of conservation, from which the present-day environmental movement grew. So, wilderness is a heritage we have long been protecting. The following are some of the categories of wild or natural areas under the jurisdiction of the United States Government.

The U.S. National Park Service administers units of the national park system, which includes parks and monuments, recreation areas such as national seashores and lakeshores, historic sites and cemeteries, and wild and scenic rivers. Within many of these units are areas which qualify for inclusion in the wilderness preservation system, or the wild and scenic river system, or scenic trails system. Hunting, logging, mining and grazing generally are prohibited within units of the national park system.

The U.S. Fish and Wildlife Service administers units of the national wildlife refuge system. Within many refuges are areas which qualify for the wilderness, scenic rivers, and scenic trails systems as well. However, even though hunting is permitted, wilderness designation precludes some wildlife management techniques through prohibitions on roads and use of mechanized equipment, and a choice must sometimes be made on which type of administration to select. If the primary mission of a refuge is to enhance the numbers and varieties of wildlife, some wildernesses as narrowly defined may have to be sacrificed. For example, one of our refuges was set aside particularly to enhance the populations of woodcock. To accomplish this objective, it is necessary to use earth-moving equipment which is not consistent with wilderness.

The U.S. Forest Service administers national forests and grasslands and

many of these units also are either in wilderness classification at the present time or are under study. This service also operates and maintains campgrounds and recreation areas of various sizes and types, and administers units of national trails and scenic rivers.

The Bureau of Land Management now has new authority to identify and administer wildernesses. The so-called public lands were previously managed entirely for multiple purposes.

This raises a point which should be mentioned here. Proponents of wilderness in other countries may often encounter the same fallacious argument propounded in the United States – that wilderness protection has a single use for the benefit of only limited numbers of people. Such is not the case. Even the most stringently managed wildernesses in our country provide multiple uses: watershed protection, hunting and fishing, primitive camping, hiking, aesthetic appreciation, and opportunities for various types of research. Some natural areas also accommodate mining, lumbering, and grazing so long as these activities do not interfere unduly with their primary functions.

An outline follows of some of the efforts of the National Wildlife Federation to preserve and protect or to enhance natural areas.

Depending upon definitions, there are about sixty conservation-environmental organizations in the United States, of which forty-seven are banded into an umbrella group known as the Natural Resources Council of America. These organizations vary in type from those composed of lay citizens, such as my own, to those supported primarily by industry and foundations, and professional societies. Frequently, these join forces in coalitions to attack specific problems, such as clean water, clean air or Mining Act reform.

The National Wildlife Federation, formed in 1936, is the largest lay conservation group in the United States. Considering our direct associate members and those who are affiliates with our state groups in all fifty states, Guam, Puerto Rico, and the Virgin Islands, as well as other contributors, we believe that we speak for three and a half million Americans. The federation has conservation objectives: "To create and encourage an awareness among the people of this nation of the need for wise use and proper management of those resources of the earth upon which the lives and welfare of men depend; the soils, the waters, the forests, the minerals, the plant life, the air, and the wildlife."

Obviously, our initial concern is for the welfare of wildlife. However, any concern for wildlife inevitably leads to the proper treatment of its habitat. And this leads to concern about water pollution, chemical poisoning, soil erosion and runoff, agriculture, water developments, and a host of other problems, even including population stabilization. Many of these problems are global and affect regions as remote as Antarctica. Our dedication to creating and encouraging an awareness has therefore become worldwide in scope. Ecology, the interrelationship of living things, knows no international boundaries or limitations.

We would hope that concerned citizens can be organized in all countries to influence natural resource policies within their own governments. Many

other nations have groups such as the National Wildlife Federation. We ourselves are co-operating extensively with the Canadian Wildlife Federation as it becomes stronger and more influential, and thought is being given to translating our *International Wildlife* magazine and *Ranger Rick's* nature magazine for children into other languages, possibly Japanese, Spanish and French. We hope and have recommended that the United Nations Environment Programme (UNEP) may focus attention on the role that non-governmental organizations (NGOs) can play in worldwide efforts toward improving the quality of our environment.

The National Wildlife Federation is recognized by the U.S. Government as an educational organization and has developed a diversified programme. It currently operates on an annual budget of about \$24 million. Except for a few relatively small specific projects funded by Federal agencies, the budget is entirely raised from private sources. We have three primary sources of income: associate annual memberships (for those who get either *National Wildlife* or *International Wildlife* magazines, or a combined worldwide membership) and *Ranger Rick* magazine for youngsters; contributions to wildlife conservation stamp distributions (some fifteen million sheets were mailed in 1977); and sales of nature-related merchandise such as bird feeders, wildlife-oriented Christmas cards, books, and similar items. Increasingly, we receive grants from foundations, industries, and institutions for specific conservation projects.

With these funds we sponsor various schemes. We publish *National Wildlife* and *International Wildlife* magazines on alternate months. Some 640 000 associate members receive *National Wildlife*; of these, 300 000 are world members who also receive *International Wildlife*. *Ranger Rick*, published monthly for the youth of six to twelve years, has a readership of over 625 000. All of these are published in full colour. Each magazine endeavours to appeal to a broad range of resource-related interests; none can be classified as a scientific journal in the usual sense. At the outset a decision was made to direct each magazine towards a popular audience, hoping to interest the unconverted in some of the basic concepts of conservation with the intent of enlisting their support. This decision was taken realizing that some articles might not appeal to some of the converted or solid conservationists, who might wish to have material in greater depth.

We also try to reach the nation's conservation leadership with special information and publish *Conservation News*, a semi-monthly digest of issues, and *Conservation Report*, a weekly digest of legislation before our Congress. *Conservation News* is distributed without charge to about 40 000 people, NWF members and non-members. *Conservation Report* is our primary lobbying arm and goes to some 7 000 associate members. Books and leaflets are prepared on resource topics of special interest. Pamphlets and data sheets are used, in part, to answer a large volume of correspondence, particularly from school children. In fact, we received 638 letters on conservation questions alone on one peak day. People ask all sorts of questions on natural history and resource issues and some, such as the preservation of whales and baby seals, require the preparation of form letters or standard letters.

Other educational efforts include preparation and distribution of materials to press and radio-TV media; organizing and conducting conferences and seminars on conservation topics; making financial grants to students; and performing research in specific areas. Our summit conferences, held in three sections of the country, attract up to 500 associate members for each session. They are planned for entire families, with each member busily engaged in topics ranging from wilderness medicine, back-packing tips and nature identification to discussions on resource issues and citizen action.

We also expend much effort on working with personnel of federal and state governmental agencies and the Congress to ensure that sound resource programmes are planned, authorized by law, funded and implemented. Many of these efforts are directed toward stating the federation's position in discussions with Federal agency personnel and with members and committees of the U.S. Congress. When all else fails, we may seek legal redress in the courts, for which a corps of five attorneys is kept busy. Our various projects include protection of wetlands, highway construction, regulations on off-road vehicles, and mining.

We employ about 400 people, some of them seasonally. Nine regional field executives and the editorial staff of *National-International Wildlife* magazines, are located in the national headquarters in two separate buildings, one in Washington, D.C., and the other in nearby Fairfax county, Virginia. The Virginia facility is equipped with two nature trail complexes, widely used by school children and others in the area.

National Wildlife Federation is proud of the record our nation has made on identifying and preserving natural areas. We are gratified that many other nations are making similar efforts. We particularly think of the preserves being set aside through UNESCO's "Man and the Biosphere" project, and regard it as an example of mounting worldwide concern for this planet. We are equally proud of the contributions of our own organization toward making the world a better place in which to live.

It is my firm conviction that man must be considered as an essential component of natural areas, not an intruder who spoils all pristine nature. All of us should avoid contributing to such an attitude. Man is just as much a part of the natural scene as any other mammal, bird, insect, or other creature. His presence does not necessarily make it bad although he, like the others, certainly can have a profoundly destructive influence. All creatures react to the environment. So, really, a pure, untouched wilderness never ever existed. The wonder and marvel of the natural world is its constant change as individual elements, including man, shift in relation to others. Man's greatest adverse impact comes when he removes natural areas in building airports, highways, metropolitan housing and shopping complexes, and industrial parks. The competition for land and habitat is the greatest threat to wildlife.

Perhaps these misconceptions or myths are stimulated by idealistic books or films or television programmes which personalize wildlife far beyond reality. Boyce Rensberger, in a new book entitled *Cult of the Wild*, puts

it this way: "If we are to have wild animals living on the earth with us – truly wild and free-living beasts – then the time has come to put away childlike ideas about what animals are. There never was a Bambi or a Big Bad Wolf. Lions are not noble, brave, clean, thrifty, or reverent. The world would not be a better place without sharks or hyenas or even without cockroaches or termites. Such notions about animals should disqualify a person from having any role in making the hard decisions that must be made in realistic and rational wildlife conservation programmes."

Our hope rests in planning. If there is a dedicated interest among enough people who will speak up to their own governments, wildernesses or natural areas of various sorts can be planned into overall land and water development. If we look ahead, it will not be necessary to drain or fill marshes so valuable to water birds, furbearers, and fish. If we so determine, shopping centres and airports and industrial sites and roads can be located away from outstanding or unique natural areas. If we give adequate attention to planning, we can identify and set aside those resource areas which are most needed by many for various beneficial purposes, not the least of which are inspirational and spiritual.

Quite literally, we agree with those who say the natural and civilized worlds must live together or perish separately. In great measure, it is up to us to assure that this does not happen.

More than a century ago, Henry David Thoreau wrote these words which have been so widely used and with which we concur: "In wilderness is the preservation of the world." The late Clinton P. Anderson, former U.S. secretary of agriculture and chairman of the U.S. Senate Committee on Interior and Insular Affairs, once said:

'Wilderness is an anchor to windward. Knowing it is there, we can also know that we are still a rich nation, tending to our resources as we should – not a people in despair scratching every last nook and cranny of our land for a board foot of lumber, a barrel of oil, a blade of grass, or a tank of water.'

As we move to meet the difficult challenge of designating and managing wilderness in a world which too often seems interested only in immediate economic benefits – and hang the long-term environmental effects – we must also rise to the challenge of a wise and improved stewardship of all of the natural resources – the land, the water, the air, and the wildlife. The task will not be easy. But it will be less burdensome if we share our strengths rather than our weaknesses.

Elliot T. Richardson, ambassador-at-large to the Law of the Sea Conference, ably stated: "There was a time when the seas seemed endless and the skies vast enough to swallow any of the mistakes and errors of man. The world used to be big and men could afford to be small. Now the world is small and men must be big."

Reservation of Wilderness Areas in South Africa

D.P. ACKERMAN

South Africa is, in comparison to most European countries, many North American states, and even some of its African neighbours or near-neighbours, a large country with a small population. It seems reasonable to believe that very large parts of South Africa should therefore still be in a primitive condition, virtually unchanged since the arrival of the white man. Unfortunately this is not so. It is difficult to get away from roads, railways or power lines, from human habitation and cultivated fields. The population may be very thinly spread in many parts of the country, but few large areas are completely uninhabited.

Because their numbers were small and their lifestyle suited to the environment, the earliest inhabitants, Bushmen and Hottentots, made very little impact on the ecosystem, but the character of the country began to change when black men moved in from the north, and changed even more rapidly when they were followed by white men from the south. They made greater demands on the country not only because they were more numerous, but also because their needs were more sophisticated. They kept large flocks of sheep and herds of goats or cattle to supply meat, milk, wool or hides – sometimes merely to display their wealth – and wrought great changes in the soil-cover by the combined effects of burning and grazing.

They tilled the ground and raised crops, not only for their own consumption, but later also for export. They cut recklessly into natural forests and savannah to satisfy their needs for firewood and timber, or to secure land for cultivation. They hunted for food, for trophies, for ivory or hides, or to exterminate the predators that threatened their herds, and in so doing changed the composition of the wildlife population and brought many species to partial or total extinction.

The combined effect of ranching, cultivation and hunting was to change the ecology of a whole sub-continent and to our forebears, as to frontiersmen the world over, the fact that they had "tamed the wilderness" was a matter of pride. Today we are grateful that there are still a few bits of untamed wilderness left us.

Throughout history mankind advanced by pushing forward the frontiers of civilization. Beyond the frontiers lay the untamed wilderness, the realms of barbarians, wastelands and deserts, the uncharted seas. The strength, endurance and ingenuity of man developed as means had to be found to conquer the frontiers – better armour and weapons, better equipment and the means to carry it, better ships with improved navigational aids. Human skills and, even more important, human character, developed to meet these challenges. With this a philosophy developed which we deplore today: the

wilderness was there to be conquered and its resources to be used to the greater good of humanity, for these resources were looked upon as virtually infinite and all that was necessary was to keep pushing the frontiers further ahead.

But during the present century the last frontiers have fallen. Roads and railways have been developed and air travel perfected so that most places on earth can now be reached with very little risk or personal effort and in a minimum of time. Everest and Aconcagua have been climbed, the poles have been reached, the basins of the Congo and Amazon rivers have been explored, the Sahara and Gobi deserts crossed. Man has set foot on the moon and the frontiers of civilization have moved out into space, where only the selected few will have the opportunity to challenge them.

Humanity has at last come to realize that its resources are finite and must be exploited with prudence, and that there is very little wilderness left. With this has come the realization that the human spirit will be the poorer for lack of a wilderness experience in which man, without the mechanized aids of the technological era, can pit his own resources against often hostile nature. This realization has led to the desire to conserve what little wilderness was still intact and protect it against the onslaughts of civilization; and nature reserves, game reserves and national parks were established in many parts of the world from the last quarter of the nineteenth century onwards. These were generally created in areas boasting of some special feature such as an abundance of wildlife, rare or spectacular plants or plant communities, or natural features like waterfalls, glaciers or thermal springs, and it was the accepted practice to facilitate public use and enjoyment of these amenities by providing roads and camps or lodges. It is only since the second quarter of the present century that deliberate efforts have been made to conserve whole landscapes or complete ecosystems in a wild and undeveloped state by designating them as wilderness areas.

The Sabie Game Reserve was proclaimed in the Transvaal Republic by President Paul Kruger before the end of the nineteenth century and was enlarged fifty years ago to become the Kruger National Park. Though this is a large park, and a number of smaller ones are also maintained by the National Parks Board, and though each of the four provinces also controls nature reserves and parks, the area so conserved in the Republic of South Africa constitutes only about three per cent of the total land area of some one and a quarter million square kilometres. This does not compare very favourably with the conservation efforts of many European countries. Even England, with its much greater population crowded into little more than 150 000 square kilometres, has set aside nine per cent of this area for national parks and similar reservations.¹

Dr. Rocco Knobel, director-general of the National Parks Board, has publicly expressed the view that at least ten per cent of a country's land surface should be set aside as conservation areas,² and Prof. Richard Fuggle, director of the School of Environmental Studies at the University of Cape Town, has said that this generation is the last one which will be able to put

aside land for conservation.³ With South Africa's population doubling every thirty years, Prof. Fuggle's statement can hardly be disputed.

Very little of South Africa's three per cent of conservation areas approaches the wilderness concept, and much of it is in fact being quite intensively developed to facilitate mass tourism. This development is no doubt essential since the public at large, which foots the bill for nature conservation, wants to see what is being conserved; and since foreign tourists are attracted to South Africa by its national parks and game reserves more than by any other features they expect good roads and good accommodation when they get here. But we also need wilderness areas.

We need them for their scientific interest as natural ecosystems virtually unaltered by modern progress. We need them for their aesthetic value as landscapes unscarred by roads, railways or power lines. We need them for the opportunities they offer in physical and spiritual recreation – the opportunity to meet nature on even terms. We even need them just for the sake of knowing that they are there, knowing that a few pieces of undeveloped Africa will be there for future generations to visit and enjoy.

Much as the other arguments may appeal to the public, I believe the most important justification for setting aside wilderness areas is their scientific value. Before mankind wrought drastic changes in his environment by the application of tools and technological aids, "the life communities of this earth", to quote Durward Allen writing in *American Forests*, "achieved stability, production and self-perpetuation through millions of years of trial and error. They are the most complex systems of the universe as we know it, and we have only begun to study how they work. The survival of man and other life in the future will require understanding how these things work, and we can't learn about it if all the original types are obliterated."⁴

In South Africa the need for establishing wilderness areas was perhaps first realized by the Natal Parks Board who, conscious of the aesthetic and recreational needs that could be met by game parks and nature reserves under their control, maintained some of their reserves in an undeveloped condition and took steps to awaken public interest in the wilderness concept by instituting guided walks through the wilderness.

Meanwhile the Department of Forestry became aware of the need to enhance the conservation status of much of the one-and-a-half million hectares of state land under its control. This department was born of the need to conserve the country's indigenous forests and to establish alternative sources of timber. Although much of its energy went into afforestation with exotics for the sake of timber production, the department also set aside nature reserves, mainly for the protection of unique plant species or plant communities, and now manages thirty such reserves ranging in size from eight to over 2 000 hectares and covering a total area of 7 556 hectares. Even though it is planned to merge two existing nature reserves and enlarge their combined area from 330 to 23 000 hectares, it can be said that the department's nature reserves are generally too intensively managed, often to maintain a particular seral stage of the plant succession, too small, and not sufficiently entrenched against encroachment, to qualify as wilderness areas.

This brings us to the question of whether South Africa can afford the luxury of setting aside wilderness areas. If the present rate of population growth is not checked we shall in thirty years have twice as many mouths to feed as we have today. We shall need all the ground we can get to raise crops and to support our livestock. How can we afford to tie up land for an ideal that precludes its use for food production? The answer lies in the fact that we do have land that cannot be used to grow food crops, to raise cattle or even to grow timber, because it is far too valuable as the source of streams or rivers to permit any form of use that may detract from the optimum yield of clear silt-free water.

It has been frequently stated that the growth of the South African economy will be limited or even halted by the scarcity of water at about the end of the present century, and as yet we have no means of producing water economically other than by good management of our natural catchments.⁵ Many of our mountain catchment areas constitute sensitive environments that require sympathetic management as they are very susceptible to wear and trampling by over use. In some of these environments even moderate grazing by domestic cattle may create excessive erosion and large numbers of visitors seeking outdoor recreation may cause similar problems. Such areas can be best conserved and protected by dedicating them as wilderness areas.

The Department of Forestry is not only concerned with the conservation of indigenous and the establishment of artificial forests, it is also the agency charged with the control of water catchment areas. Of the 1 620 000 hectares of state land managed by this department about 1 120 000 hectares are classified as mountain catchment areas to be managed with the primary objective of conserving the country's water resources, and it is in such areas that we can still find the nearest approach to untouched wilderness.

These mountainous areas include some of South Africa's most spectacular scenery, and their use for extensive outdoor recreation by responsible people will not conflict with the primary object of their conservation as water catchments to ensure the optimum sustained yield of clear water. To cater to the demands of a mixed public, various means of access into the mountain regions will be called for. In certain less sensitive areas intensive developments such as scenic drives and possibly even aerial cableways will not be out of place, whereas other areas provide a unique opportunity for their permanent entrenchment as wilderness.

Future generations may well regard the amendment of the Forest Act of 1971 as one of the most significant steps taken by Parliament in that year. This amendment empowers the Minister of Forestry to set aside any state forest or any portion of it as a wilderness area for the preservation of forests and natural scenery, and entrenches such areas against encroachment to the extent that any rights over them, for instance for the construction of roads or erection of power lines, may be granted only with the concurrence of both houses of Parliament. The amendment recognizes that maintenance of wilderness areas is of great cultural and scientific value by stipulating that the Minister shall obtain the recommendation of the National Monuments Coun-

cil before proclaiming a wilderness area, and that the Secretary for Forestry shall consult that council in the management of those areas.

Since the passage of the wilderness amendment the Department of Forestry has been taking a close look at all land under its control to see what areas qualify as wilderness. The ideal is that it must be an undeveloped area, uninhabited by man, with an intrinsically wild appearance and character giving the general impression that it has resulted from the combined effects of natural forces. If a completely puristic approach were to be followed, however, few areas would be found to qualify as wilderness. The department has therefore accepted the principle that disturbed areas may be included as wilderness provided they can be restored to their original wild condition.

Three wilderness areas have now been set aside in Natal and two in the Cape Province, with a total area of 184 500 hectares. An additional quarter of a million hectares comprising one area in Transvaal, one in Natal, and four more in the Cape Province are at present under consideration. If this materializes, wilderness areas will cover twenty-seven per cent of the entire forest estate of the Republic.

In managing wilderness areas the object will be to interfere as little as possible with nature, but here again it will not be practicable to adopt a completely puristic approach. The existing and proposed areas are situated in mountain catchments where the national interest dictates that the optimum water yield shall be the first priority of management, and in most types of veld this will require periodic burning. At the same time the areas must be protected against untimely wild fires, and this means that provision must be made to get men and their equipment into the area without undue loss of time. The roads required for this purpose will, however, be kept to a minimum and will be as unobtrusive as possible, of minimum standards for four-wheel drive vehicles, and will be supplemented by sympathetically planned bridle paths to facilitate patrols and inspections on foot or on horseback.

The public will be encouraged to visit and enjoy wilderness areas except in a few cases where the survival of endangered plant or animal species is at stake. Over use will be guarded against and restrictions placed on the number of visitors, lest the very values we seek to protect should be destroyed. Entry into a wilderness area will therefore be by permit only, through prescribed entry points. No motorized vehicles, power boats or aircraft will be given access, but in some cases horses will be permitted. Visitors will be required to carry out all empty containers and packaging materials as experience has shown that buried rubbish is frequently dug out and scattered by baboons. Responsible visitors will understand the need for these restrictions and will even, I trust, accept the painful fact that camp fires will have to be banned completely in certain areas where continued gathering of firewood is proving detrimental to the environment.

There is much potential wilderness land outside the boundaries of the state forests. Some of it is private, but I believe in most cases ownership is vested in a provincial or local authority. May I ask that, before it is too late, the owners of such land should take a good look at it and save what can still be saved as wilderness for the sake of our descendents.

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Wilderness and the Evolution of Human Culture

PROFESSOR AMOTZ ZAHAVI

The culture of man, his art, morals and social values are spiritual characters which are not thought of as material assets of individuals who possess them. An investment in culture seems to decrease the potential to invest in material gains. Accordingly, in times of surplus culture flourishes, and vice versa. An individual whose belief in values or his morality inhibits him from winning an easy material gain seems to be potentially less successful to compete with an immoral individual or with one who does not believe in social values. According to Darwinian evolutionary theory, characters spread in a population because of the advantage they confer on individuals who possess them over others who do not. The problem concerning the evolution of culture is the inclination to emphasize advantages – ultimately manifested in reproductive success – which art, morals and social values confer on individuals who possess them. Although most people tend to admit a certain interdependence of mind and body, the usual tendency is to study and consider the two as separate research disciplines.

I would like to suggest, from my experience with the socio-biology of birds, that culture evolves by the same evolutionary process by which material characters evolve from one another, since culture also contributes to the biological advantage of individuals.

Success is based not only on the potential to acquire material advantages. The collection and spreading of information to potential collaborators (that is advertisement) are also essential in evolutionary competition. The investment in acquiring material advantages like food and shelter are easily appreciated. The gain in information or the investment in advertisement is not as easy to measure.

I suggest that most if not all of our cultural characteristics including art and social values have evolved as a consequence of the individual's need to gain and spread information.

I would like to illustrate my point with some facts from the socio-biology of babblers which I have studied over the last seven years.

A female babbler is a shy bird. It never mates in the presence of other babblers. It does not mind the presence of human beings or other creatures. Male babblers co-operate in the defence of their common territory. The breeding female is always a new member in a group of male babblers. Her problem is to decide with whom to mate. Mature male babblers hardly ever quarrel, since intra-group aggression lowers the competitive ability of the group to fight other groups. As a result the female cannot easily observe to what extent the dominant babblers can control its group members. The infor-

mation is important to her since unless the dominant one can control its group members it may not be able to defend its brood from its own group members which compete with it over the reproductive potential of the group. By the simple programme of being shy the female demands from the dominant male that it control its group members from a distance. The group must stay far away when the dominant pair departs to mate. Unless the male can control its group to keep at a distance, the female does not commit itself to the investment in reproduction. Female babblers share with humans another interesting behaviour pattern. Incest is strictly not practised. The biological advantage of a taboo on incest is well known.

Altruism is often manifested in babblers by the presentation of food among adults. Babblers present food to one another even when the donor is still hungry. Investigation of this altruistic act reveals that it is always the dominant male which presents the food to the subordinate. The very few cases in which a subordinate has presented food to a dominant resulted in a fight between the two. Otherwise mature male babblers hardly fight with other mature males of their group. I suggest that the altruistic act advertises the superior quality of the dominant over the subordinate. An individual which can afford the handicap of sacrificing some of its material assets for the sake of another individual advertises its superiority. The wish to advertise superiority is channelled in groups of interdependent individuals, into investment in the welfare of the handicapped. The advertisement of dominance minimizes the need to compete by brute force and is therefore contributing to all individuals. The investment in altruistic acts also strengthens the subordinates on which the strength of the dominant is to some extent dependent. Altruism in a group of individuals interdependent on one another serves every member of the community. The subordinate needs it while the dominant gains from its own investment. I do not suggest that we calculate our actions when we act altruistically. We are simply programmed to be good and altruistic since it serves our own individual interests.

It is reasonable to assume that the sense of beauty adds to our own material advantage. For the sake of brevity I shall illustrate my point with one simple example. The roundest and the nicest tomato is the least likely to have suffered from diseases or parasites and is more likely to be a good tomato. Thus the sense of beauty helps the individual to select for material quality. It guides him to reject deformed non-symmetrical items and consequently helps him to avoid low-quality products. The ability to produce a product which is also beautiful advertises the ability of the producers to manufacture good quality products. Assume that a customer is looking for a perfect disc. His problem is to select the best of two or more good ones. It is easier to pick the better of the two, the more perfect round disc, if it is decorated with a point in its middle and a nice parallel line next to its edge. The producer gains from having the artistic ability to decorate the discs he produced, since otherwise they would be considered equal to others which are not as perfect. The customer will benefit from his sense of beauty as particular decorations call the attention to certain defects. At present my students and myself study the techniques by which animals advertise their quality in

form, colour and pattern. I believe it to be a study of the biological basis of art.

Wilderness has been the habitat in which human culture has evolved. Wilderness provided the background, the selecting factors which guided our culture to provide the information which was useful for these communities living in their respective habitats.

If we wish to understand the origin of our basic spiritual human qualities, it is the wilderness habitat to which we must return for such a study. The diversity of human cultures and human sense of beauty could possibly be interpreted within the varying wilderness habitats. Different habitats demanded different sets of information to guide individuals in their everyday life. Unless we keep as many and as varied wilderness habitats we may never be able to study the origin of the diversity of human culture.

We may suggest that the urge to possess vast lands much larger than we need for food and shelter has evolved from territorial behaviour. Estate owners, like territorial animals, conserve their resources not only for their own personal immediate need, but also conserve the surplus for future generations. Royal hunting reserves and similar areas have been an important conserving factor in many countries. I suggest that the extra energy the individual invested to conserve the resources for the future – which seemingly handicapped him in his competition with individuals who did not invest for the sake of conservation for future generations – advertised the wealth of that individual and thus compensated him for his investment in conservation. The prestige he gained as a wealthy individual from investing in conservation helped him to gain immediate material advantages.

Investment in culture is basically not different from investment in conservation. In both cases individuals are requested to sacrifice an immediate material gain for the sake of a gain for future generations, or for the interest of the community as a whole.

Let us hope that as conservationists we shall be able to raise the prestige of conservation to the extent that long-term investment for the sake of conservation will raise the prestige of the investor to such an extent that people will become enthusiastic to invest their time and resources in wilderness conservation.

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People of the Wilderness

DICK ROUGHSEY

My people, the Aboriginal Australians, have inhabited that great island continent since remote times. Archaeologists have obtained carbon dates indicating the presence of people in Australia as far back as about 40 000 years ago.

As to our origin, I present the views of William Howells and others. Howells listed the various theories of anthropologists and other experts as follows: Australia represents the home of mankind; the Australians are descended from Neanderthal man; they are the living representatives of an early *Homo sapiens* stage; they are a product of a mixture between a "white" and a Negrito or Negro stock, and Tasmanian and Polynesian.

Howells was inclined to think the Australians are living representatives of an early *Homo Sapiens* stage, and went on to say:

"The Australian is not a blend but a major race, and is the most archaic still surviving. He probably represents with considerable fidelity the morphological stage attained by *Homo Sapiens* in Asia at that remote time when he wandered out into the Pacific and isolation. He may have undergone some minor changes, but he is intrinsically what he was when he left the evolutionary crucible on the Asiatic mainland, which has since given off Negroid, Mongoloid, the unspecified white, and American Indian."

In his summary Howells said: "The Australoid type originated on the Asiatic continent, perhaps in India, and spread in the western Pacific as the first representative of modern man, probably at a very remote period."

A few ancient fossil skulls have been found in Australia and all have been classified as *Homo sapiens* by the anatomist Professor N. MacIntosh of the University of Sydney. After comparing the Australian fossils with *Homo erectus* and Solo man of Java, Professor MacIntosh concluded that the present stage of study of the Australian fossil relics suggests links with the fossil forms of Java.

Whatever our origins, early people lived in the wilderness and were a part of it. Over the millenia they flourished sufficiently to produce a race of philosophers who developed a civilization of high degree based on spiritual and not material values. The old people were animists, believing that every tree and rock, every stick and stone, had a spirit, so everything in their environment was meaningful and was entitled to its proper place and proper respect.

Our concept of creation is that in the beginning all things, all animals and plants, were men. These supernatural beings, and progenitors of man, turned themselves into animals and plants and eventually sank into the earth

to become natural features of the landscape and the spirit-homes of the ancestral beings. From these totemic centres the spirit-force of all human, animal and plant life was constantly being revitalized.

When the first Europeans came to Australia our Aboriginal people had evolved a society and way of life which will eventually be recognized as one of the most extraordinary, in many ways the most idyllic, ever evolved by man. All his needs, spiritual and material, were provided for and assured, and he lived in total harmony with his environment, the wilderness.

All the continent was occupied by several hundred tribes speaking as many languages. The clans within the tribes lived within clearly defined boundaries of clan country. Family hordes owned sections of the clan country and lived semi-nomadic lives hunting and foraging over it, their movements dictated by the seasons.

We were never true herdsmen or agriculturists, probably because none of the marsupial animals of the country could be domesticated. Elementary forms of animal husbandry had been evolved, such as seasonal burning of grass to keep a constant supply of green shoots for grazing marsupials. The totemic system and other tribal laws provided strict guidelines for harvesting and sharing animal and plant crops, laws which ensured the conservation of all things essential to the survival of the race. Our people may well have been the first conservationists.

The face of the early wilderness was undoubtedly changed by the fires of our ancestors, so that the forests adapted, many trees and plants eventually needing fire for proper germination.

After all those thousands of years, when the Europeans arrived it was still a wilderness of vast forests with even the central deserts having an adequate cover of vegetation. However, after less than 200 years, clearing of the land for grazing, agriculture, and timber cutting has resulted in the disappearance of most of the ancient wilderness so that only pockets of it remain.

The great wedge of Cape York peninsula is our largest remaining wilderness. We seek help to save it for the benefit of all mankind, of the present and the future.

A Different Kind of Captivity

WILLIAM CONWAY

If you have never danced with a whooping crane, chuffed with a tiger or helped a bog turtle out of its egg shell, you may entertain either an idealized view of wild creatures and wilderness characterized by noble beasts – or a dispassionate one of inexorable statistics and neat mathematical models. However, if you can admit to what Donald Griffin calls an “evolutionary continuity of mental experience” in all living creatures and would be willing to take to the water after the fashion of a Konrad Lorenz to help goslings learn to swim, you have a selective advantage in understanding what follows.

At present rates of human exploitation, most of the earth’s major ecosystems and its wilderness areas will be fragmented during the next twenty-five years. Much of its most beautiful and inspiring wildlife will be lost, to say nothing of its resilience against further damage. This quite thinkable possibility is beginning to stimulate an extraordinarily diverse, often bizarre, effort to preserve vanishing animals through intensive manipulation of their behaviour, physiology, even their ecology, and by captive propagation. Such programmes are not treating with the ultimate causation of wildlife endangerment. They are dealing only with the symptoms – the loss of species. Yet the act of preserving a species can be a powerful strategy in moving man to reconsider environmental destruction to preserve wilderness. And it would be helpful to have some species if some of the ultimate problems are solved. Besides, the early results of these new programmes reveal the need for a new view of rare animal futures, new hope for some whose plight once would have been hopeless – basically, however, a kind of captivity for much that is now wild.

“Nature should be allowed to take its course,” cry many who decry the manipulation of wildlife through management or captive propagation. Few debate this view where nearly natural and complete ecosystems remain. Where they do not, it is unrealistic. Regrettably, such attitudes seriously hinder efforts to propagate animals in captivity and continue to retard many other supportive projects essential to the survival of an increasing number of wild creatures.

Clearly, only a little of nature has any prospect of remaining undisturbed. For example, a third of the Amazon tropical forest, the world’s largest, has already been cut and more than 59 569 km² of forest are being cut, primarily for agriculture, in northern South America each year. However, scientists at the Nairobi conference on desertification have just calculated that around the world about 5 665 624 hectares of fertile, productive land are being denuded and destroyed by unsound agricultural practices annually. The earth’s most productive land is already being cultivated and a third of it

will be lost, at this rate, during the next twenty-five years while man's need for food will double. Sobering figures like these might help one to remember that it is farmers and fishermen, woodcutters and miners, not government bureaux or conservationists, who are the real managers of the earth's environments. What is left of wilderness is being contracted into smaller and smaller islands; great jungles, savannahs, marshes reduced to remnants. Parks alone, existing or contemplated, will not be able to sustain some of the most interesting of wild creatures.

Subject to decay and successional change, many of the habitats preserved in parks will prove to be less than the minimum critical size required to sustain, unaided, viable populations of various species. Some smaller refuges, or larger ones subject to changes imposed by unanticipated or uncontrolled imbalances in their wildlife populations, have already lost much of their diversity. Most parks and refuges founded a decade or two ago were, in effect, much larger than they are now for they were surrounded by undeveloped lands. Today, cotton fields are cultivated upon the very border of even the great Serengeti while other parks are being surrounded by fences which further fragment once interbreeding animal populations. Only very large parks including exceptional representations of the various habitats in an ecosystem have much chance of maintaining their original biota without increasingly intensive management. It is against this background, and the spur applied by man's inevitably tardy conviction that it is much worse to lose the last animal in a population than the first, that a series of intensively manipulative efforts have been launched to preserve refugees from despoiled habitats.

In Baraboo, Wisconsin, a serious bespectacled young man rises early and goes dancing each morning with a female whooping crane. In Sweden, volunteers haul a dead, pesticide free pig to the edge of a North Sea beach for white-tailed sea eagles to eat. At the Darwin station in the Galapagos, a scientist feeds hatching giant tortoises. At the Bronx Zoo in New York, zoologists stand by to aid a pregnant Mongolian wild horse should delivery be difficult. In the Bialowieza forest in Poland, a truck driver deposits hay for a herd of hulking European forest bison and, at the Pretoria zoo, a biologist prepares a fruit salad for a small colony of the rare Rodriguez Island flying fox. Each of these activities bespeaks a dedication to the continued survival of a wild creature which, because of man, is no longer able to survive without man and each is representative of a growing new concept of responsibility towards wildlife, a new relationship between man and animal.

Most endangered animals have been victimized by unnatural pressures, such as new competitors, predators, pollution and disease, and reduced resources, such as lack of healthful food, nesting sites and cover. Their populations may be so small or fragmented that breeding is prevented or that minor environmental fluctuations could result in their extinction. Where that conservation basic, habitat preservation, cannot be adequately realized or comes too late, several manipulative approaches are being used to respond to these problems; improvement of breeding success, habitat management, modification of behaviour patterns to increase survival under changed conditions, es-

establishment of new wild populations, transplantation, re-introduction into nature and propagation in captivity.

The serious young man dancing his mornings away with a whooping crane is Dr. George Archibald. His purpose is to strengthen the pair-bond he has established with this abnormal crane and so induce her to lay eggs after being fertilized with semen extracted from a captive male kept nearby – improvement of breeding success. Although neither bird is capable of breeding normally (because of behavioural problems), their genes are too important to be lost to the tiny surviving population of their species. And manipulation of bird-breeding biology is becoming so sophisticated that we have every reason for confidence in the ultimate success of Archibald's courtship.

Reduced to less than sixty birds in nature, whooping cranes are also the subject of a pioneering effort to establish a whole new population on a new range. Since May of 1975, whooper eggs laid by a captive flock at the Patuxent propagation centre in Maryland have been placed in the nests of sandhill cranes breeding in Idaho. It was hoped that the foster parent sandhills would not only rear the whooping crane chicks but also teach them their own migratory route south. By the spring of 1977, it was clear that this is precisely what had happened. However, it is not yet known whether the young whoopers will seek mates among their own kind or, as a result of imprinting upon the foster parents, hybridize with sandhills. Preliminary signs are encouraging for the youngsters seem to be seeking each other out in preference to sandhills. Besides learning the new migratory route, the whoopers have also learned the very different feeding ecology of the sandhill crane. Thus, there has been a modification of behaviour patterns and, perhaps, the establishment of a new wild population.

Incidentally, Archibald's crane courtship is not unique. Dr. Stanley Temple won acceptance as mate by a female golden eagle at the bird of prey breeding facility at Cornell University in New York. When Temple's eagle began incubation of her eggs, he had to leave class regularly, rush across campus to the cage and stand his turn at incubation duty with a hot water bottle. Only upon his appearance would his faithful mate leave her nest to feed and preen. This project and others like it has given new insights into propagating birds of prey.

Complex techniques like these, employing artificial insemination, artificial incubation, egg transfers from successful captive or wild populations to unsuccessful wild populations, stimulation of double clutches, cross-fostering between related species as well as the use of imprinting upon human mates to stimulate ovulation and ease artificial insemination are being used to improve breeding success in a variety of faltering bird populations from New Zealand to Canada. Each is dependent upon exceptionally sensitive understanding of individual animals by individual men – inevitably a kind of captivity. An older supportive technique depends upon a bird's ability to learn to alter its nesting ecology.

Bluebirds, threatened in North America by the introduced starling and the English sparrow are now largely dependent upon man-made nest boxes. In Canada, a 3 220 kilometer long "blue-bird trail" provided boxes for 7 000

nesting pairs of bluebirds last year. The purple martin is equally dependent upon man-made nests, historically so, for it appears that Indians hung out hollow gourds for it. Artificial cliff ledges in Turkey have improved the nesting success of the endangered bald ibis while concrete nesting ledges experimentally constructed in a Trinidad cave have helped to treble its breeding population of the nocturnal oilbird. The Bermuda petrel's tiny surviving population is now almost completely dependent upon artificial nest burrows whose entrances are fashioned millimeters too small for its aggressive and abundant nest competitor, the white-tailed tropic bird and almost all wild Puerto Rican parrots are now nesting in boxes made of PVC sewer pipe erected in their rain forests. Even ospreys and eagles now build their bulky nests on man-made platforms in some areas where their secluded nesting trees have been felled. Yet, again, each of these examples implies a kind of captivity.

The rarity of Kirtland's warbler of North America, nesting in a small area of Michigan and wintering in the Bahamas, has occasioned an even more elaborate manipulation of its nesting ecology and its habitat. Because the birds nest in thickets of Jack pines, six to thirteen years old, which arise after a fire, several thousand hectares have been set aside and subjected to controlled burns for its use. However, when man's agricultural practices permitted the advance of a brood parasite, the brown-headed cowbird, even this was not enough. Over half of all the warbler nests were parasitized and the population fell alarmingly. So in 1972, cowbird trapping was initiated and more than 17 000 cowbirds have been removed, with the result that the warbler has made a phenomenal comeback.

Transplanting animals from vigorous wild or protected populations to areas from which they have been extirpated has been a particularly successful technique with big mammals. The pioneering work of Ian Player with the white rhinoceros is at once one of the most important and difficult such programmes ever attempted. Moreover, the movement of populations of bontebok and white-tailed gnu, following their crucial protection by South Africans like Van der Byl, Albertyn, du Plessis and Terblanche have resulted in the survival of these forms despite long odds. Recently, the New Zealanders have saved an unusual bird, the saddleback, from certain extinction by introduced cats through bodily moving a part of the population to a protected island. All of the population not transplanted has been lost.

Supplementary feeding of faltering animal populations is yet another technique borrowed from captivity and constituting a modification of both ecology and behaviour. It is now proving necessary in a long list of disturbed ecosystems. Some populations of elk in the United States, the lions in the Gir forest of India and sacred and white-naped cranes in Japan are all supported in this way. Stanley Temple has suggested that in the readiness of animals to adopt such help is an important lesson, a species' habitat and food selection may be the result of early experiences and there is greater flexibility in the requirements of wild animals than might have been expected. Nevertheless, the most demanding of manipulative techniques is the total commitment implied by propagation in captivity.

Some conservationists are wary of captive propagation programmes because of genetic difficulties which can be posed by inbreeding small propagules. Besides, problems may be experienced in re-introducing captive-bred animals into nature – where that alternative still exists. However, the potential for genetic problems is not restricted to captive populations and those of re-introduction are by no means universal.

The maintenance of a captive gene bank has the potential to greatly increase the size of a species' functional population and habitat holdings if representatives of the captive population are interchanged with the wild from time to time. It can also act as insurance if the wild population is lost. Thus, exchange relationships between parks with necessarily small populations of certain species and zoos with propagation programmes for the same animals could be highly beneficial. Predators may pose a special responsibility to captive collections for we have not determined how to live with great predators, such as tigers and grizzly bears. Already, there are more Siberian tigers in zoos than in nature. Other species such as the Formosan deer, the Pere David deer and Mongolian wild horse survive only in captivity while the European bison survives in preserves as a result of re-introductions from zoos after its extinction in nature. Captive breeding has also saved at least one of the world's rarest reptiles, the giant tortoise of Hood Island in the Galapagos. Feral goats had denuded its home of vegetation and by 1970, when all tortoises that could be found were taken into captivity at the Darwin station there were only two males and twelve females. There was no evidence of successful breeding in this century. However, since 1970, eighty-eight young have been produced in captivity and some have already been returned to Hood. Trumpeter swans, New Zealand scaup, Hawaiian geese and many other birds also have been helped by re-introductions from captive breeding programmes and captive stocks of other endangered species are rapidly accumulating.

In the last ten years, there has been an explosion of successful captive breeding programmes in zoos. Nearly one-twelfth of all the living species of birds and a fifth of the mammals were bred in captivity during the past two years. By way of example, the total number of captive-bred gorillas in collections reporting in the 1965 census of the *International Zoo Yearbook* was only eight, but for 1975 it was seventy-two. Comparable figures for Siberian tigers are sixty-three and four hundred and twenty-two; for Arabian oryx, seven and fifty-nine; for cheetah, nought and one hundred and two. However, zoos have limitations. All the zoo exhibits in the world could fit within the borough of Brooklyn, easily. In this connection, the potentials of game ranching may be great.

While inbreeding in captive collections may become a problem, today populations of rare animals in nature are often no larger than those in captivity, sometimes smaller. Moreover, animals, perhaps individual populations, vary in their responses to inbreeding. Retention of genetic variability is not necessarily consistent with a species' physiological plasticity. The most inbred population may have genes for an adaptability which gives it an advantage over a population much more richly endowed. The northern eleph-

ant seal's population has recovered from a low of less than twenty, eighty years ago, to more than 30 000 today during a period of great change in its coastal environment. In South Africa, the survival of Addo's isolated elephants despite intensive inbreeding is a case in point. Island species, and others traditionally confined to small populations, may ultimately prove more resistant to the effects of inbreeding than those of wider dispersion capable of finding environments to which they are adapted rather than adapting to changes in a restricted habitat. In any case the potential for loss of genetic variability in wild populations is probably greater than in soundly managed captive populations of comparable size. Because captive animals usually live longer than their wild relatives, the turnover of generations is slower and the opportunity for selective pressures to affect genotype is reduced. Captive parents are likely to have a greater opportunity to pass on their genes in a greater number of combinations to more young over a larger number of breedings than would occur in nature.

Re-introduction of captive-bred animals into nature can be simple and uneventful as in the case of the American bison, some of whose populations are wholly established from animals bred in New York's Bronx Zoo and shipped to empty western refuges between 1907 and 1917. In fact, many captive-bred ungulates have been successfully re-established in nature. However, when an animal is dependent upon complex learned behaviours, for example, the hunting behaviour of great cats and birds of prey, the task can be much more difficult. Too often, those releasing captive animals into nature have done so with little understanding. Surprise and disappointment are expressed when a creature that has never eaten anything but a ration from a steel dish fails to learn to protect itself against predators, to seek shelter or to adapt to a new diet overnight. However, better understanding of the problem gives hope of new successes.

Among the most difficult of re-introduction is the present attempt by Dr. Tom Cade to re-establish the peregrine falcon in the eastern United States where it is extinct, and by Richard Fyfe in Canada where it is greatly reduced. The bird has been lost because of the effect of chlorinated hydrocarbons upon its reproduction. With the banning of DDT and related compounds, there has been a decline of toxic residues in the environment but this came too late for the birds in the eastern U.S. In an extraordinary captive breeding programme now seven years old, three hundred and thirty-one peregrines have been bred at Cornell University and the effort to re-introduce them in nature is now underway through a process falconers call hacking.

On steel towers, cliff ledges and old treetop hawk nests, chicks bred in captivity are being reared by caretakers they can't see. Raised from artificially incubated eggs during their first weeks by Cade's assistants, then fostered for a time by captive falcons, until finally they are placed at the eyries where it is hoped they will breed as adults, several weeks before they can fly. There, to avoid excessive familiarity with man, their food is delivered by invisible attendants through a long pipe.

Surprisingly, the chicks are showing a high rate of survival; an ability to learn to hunt for themselves as long as they can return, for a few weeks, to

food at the eyrie when hunting is bad. Already, last year's birds have successfully wintered and are being seen where there have been no falcons for decades. This spring, P21, a captive-bred Canadian bird, mated with a wild peregrine and reared three chicks; the first captive-bred peregrine ever to breed in nature! Obviously, however, re-introducing captive-bred animals to nature is not simply a matter of dumping them out to shift for themselves.

The very word captivity is repugnant, yet when wild creatures are dependent for their survival on sewer pipe nest boxes, upon artificial feeding, upon transplantation to replace natural dispersion, or artificial incubation and cross-fostering, trapping of predators and competitors, not to mention long-term captive propagation, that is hardly freedom. It is time that there be an evolution in man's perception of animal captivity away from the stereotyped notions of incarceration and towards a constructive concept of ultimate responsibility and care. The alternative for some species is extinction.

Reserves and parks are our most important conservation efforts, by far. But, when we try to keep animal refugia in place, we forget that refugia are transient and always have been. Eventually we surround and lay siege to each of our preserves, leaving some of their denizens nowhere to move as their habitats decay and succeed one another – and no way to adapt, unaided. Higher animals cannot evolve so fast. The life of the shortest-lived taxa is eons greater than that of the longest-lived civilization: the age of a score of penguin colonies greater than that of the oldest of human cities. The grand international strategies that the protection of large functional ecosystems require are not likely to be wholly implemented in the foreseeable future and the programmes of conservationists must reflect not only changing perceptions of values but also historical opportunities. Our growing understanding of animal requirements and the potentials of captive management is such an opportunity. Combined with the fact of a steadily shrinking wilderness, it is clear that there are few situations where "the best management is no management."

Where we cannot provide a sufficiently rich environmental panoply for natural communities to follow their wild rhythms, we must maintain or create the needed habitats – or modify the lives and behaviour of the animals important to us so as to enable them to survive. One way or the other, it amounts to a different kind of captivity.



△ Wild dogs, jackals and many lesser meat-eaters are still as abundant as they ever were in some African wilderness areas.

Flamingoes at St. Lucia, Natal ▽





△ The rare sight of a black rhino standing beside a white rhino. The black rhino (left) is a browser and has rounded ears, whereas the white rhino (right) is square-jawed and a grazer. Picture by Mike Meyers.

Purple crested lourie.
The lourie is regarded by the Swazi people as a royal bird whose feathers can be worn only by members of the royal family ▽



Wilderness and Wildlife in Kenya

E.T. MONKS

Kenya has been my home for thirty-five years and it grieves me to see the wilderness and wildlife being destroyed at such a frightening rate – not by encroachment of the concrete jungle but by the desert and the bullet.

The problems which face wildlife in Kenya are not unique, they are those which face wildlife in all the developing countries. Problems not just of too many people, but of too many poor people; problems of overgrazing leading to diminishing returns that demand more and more land.

Little was known of Kenya at the end of the nineteenth century. Amid much protest in Whitehall, the "lunatic line", the railway from Mombasa to Uganda was approved. In 1895 George Whitehouse arrived in Mombasa to begin work on the project which was to bring civilization and progress – western style, to Kenya. Missionaries and medicine-bringing techniques decades ahead of land-use technology set the course for the population explosion and the desertification of Kenya, which now threatens eighty per cent of the country. The population rose from 2,5 million. With a growth rate of 2,8 per cent Kenya embarked on a family planning programme. The growth rate increased to 3,5 per cent and in some areas exceeded it, demonstrating again that population control does not require only birth control but raising the standard of living, so that parents may appreciate that only by birth control can they achieve, maintain and bring up children to a better standard. As only seventeen per cent of Kenya has agricultural potential, the carrying capacity of the land has already been reached and in many areas exceeded.

It is not surprising that resources of soil, forests and wildlife are under relentless pressure from ever-increasing numbers of people wanting greater returns and higher yields, but in fact reaping progressively smaller harvests.

Seventy years ago it was possible for the nomadic pastoral tribes to denude an area of its vegetation cover and then to move on. In time the land would recover. Today there is nowhere to move to.

Some 100 000 Turkana, for example, who live in the western area of Kenya on 59 569 730 km² of semi-arid desert must move their homesteads four to five times a year. Each family of twenty or so cuts down thorn bushes each time it moves – they are running out of thorn bushes and the true desert is that much nearer. The coastal strip and small areas in the central and western provinces have adequate rainfall and are amenable to high-yield cultivation, but in these areas the wildlife has been eliminated. Since 1920 the twenty to thirty thousand head of game in the Embu district alone have completely disappeared. This is not surprising, for Kenya is essentially an agricultural country. In 1975, before the escalating prices of tea and coffee, agricultural production was valued at £348 million while the returns from tour-

ism were only ten per cent of this value. It is not possible to have wildlife in agricultural areas. There is little place for conservation in the life of a family man whose aim is to stay alive. The attitude towards wildlife by the visitor on two weeks vacation is vastly different from that of the farmer whose carefully tended mealie crop disappears overnight, trampled by elephants. There is much truth in the belief that wildlife conservation belongs to the affluent society. Certainly there is no attitude more common than a broad-minded tolerance of the damage caused to other people's property by wildlife.

Although some seventy per cent of the population is concentrated on the seventeen per cent of arable land, the remaining population is dispersed over what is euphemistically referred to as rangeland. Two thirds of this has a rainfall below three hundred and seventy millimeters and some areas such as that around Lake Turkana have known drought conditions for the last eight years with an average rainfall of fifty millimeters or less. Livestock pressures in these areas, following improved veterinary services and water being made available, has caused the carrying capacity to decline steadily over the past fifty years. Drought and famine have become chronic and there is a frightening expansion of desertification. The local pastoralist tribesmen do not attribute the desert expansion to overgrazing and destruction of trees but to the will of God. It is difficult, therefore, to convey the message of de-stocking and protection of trees. Without the co-operation of the local people it is impossible to stop desert encroachment which is proceeding at a rate far greater than the rate at which the people can be educated.

Trees are cut for charcoal – and without other fuel who can condemn this – but the trees cut down are not replaced and much of the charcoal is shipped to the Yemen illegally and the desert moves that much closer. Much of the wildlife habitat is protected by tsetse fly – thirty per cent of Kenya's marginal rangeland is tsetse-infested and domestic stock have thereby been excluded. It would appear that wildlife lives in balance with trypanosomiasis and breaks down to the disease only under stress. Manufacturers of trypanosomicidal drugs have in the past hailed their products as allowing East Africa to develop as the Argentine of Africa, without taking into consideration the devastating effect on the environment of vastly increased herds of domestic stock. The tsetse fly has probably had an incalculable effect in curtailing erosion and desertification.

Rinderpest was introduced into Africa through cattle imported into Egypt in 1840. The disease swept through the continent, reaching Kenya in 1890, devastating domestic stock and wildlife. Ninety per cent of the buffalo population was wiped out, and eland, giraffe, wildebeeste and kudu were all affected. The remarkable recuperative powers of wildlife were demonstrated by the recovery of the buffalo herds to nuisance proportions within ten years of the second epidemic in 1897.

In 1942 rinderpest vaccination was introduced and in the Narok area alone the cattle increased from a stable 400 000 to 600 000 by 1960, with extensive range destruction. Two years of drought reduced the population back to 400 000. There followed a period of range regeneration but gradually the

cattle built up. The grazing areas were destroyed and the cycle continued. Each regeneration is that much slower and more incomplete.

With the deterioration of rangeland, the wildlife populations move out and many areas show a complete absence of herbivores. This does not necessarily depress the predator population. The lion is territorial and in the Maralal area for example, where herbivores have disappeared through poaching or range destruction, the lion population is considered to have increased to its 1920 proportions, feeding on livestock and humans.

Overall, the population of wildlife in Kenya has fallen by ninety per cent from that of seventy years ago. The vast herds which roamed the plains have gone, depleted by disease, the ravages of two world wars when troops and prisoners-of-war were fed on game meat, poaching and systematic culling. Human population growth and pressures are undoubtedly the main problems. Development of ranching schemes has resulted in a reduction of wildlife population and the loss of a unique heritage. Research into wildlife usage has not been fully undertaken and the value of wildlife in terms of economic productivity and reduced rangeland destruction has still not been fully undertaken. Nor has the value of wildlife in terms of economic productivity and reduced rangeland destruction been adequately realized.

Within the game areas, financial inducement to protect wildlife was offered by the government to African landowners, particularly Masai, in the form of payments from concession areas per head of game shot by hunters. With the ban on hunting the payment has ceased and the ranchers can see no reason why the sparse grazing should be consumed by wild animals on which they get no return, at the expense of their own domestic stock. There is therefore no inducement for the ranchers to act as anti-poaching agents or refrain from killing the wildlife themselves.

The rhino is now an endangered species in Kenya. Systematically destroyed in the past to make way for agriculture – A.J. Hunter claimed to have shot 1 000 rhino in game control – poached for its horn, dying from drought and up to the time of the hunting ban shot on licence by hunters in increased numbers, its future looks bleak indeed. In the Tsavo ecosystem alone the numbers have been reduced from 6 000 to 9 000 in 1963 to less than 1 500 today. The estimated total for Kenya of 11 000 in 1963 is today reduced to 4 500. Accurate figures are not available, but the export of rhino horn from Kenya reflects this loss: in 1976 3 300 kg of rhino horn were exported, representing over 1 000 rhinos; in 1975 4 500 kg representing some 1 500 rhinos; during the period 1972/76 9 800 horns were exported. In 1964 Ian Player provided five white rhinos for Kenya to try to establish a breeding herd. The number was really inadequate but by 1977 the number had increased to eight. Late in 1977 the two breeding bulls and a cow were poached from Iwenu Park, effectively bringing to an end the experiment.

It would seem the black rhino is slipping into extinction, not as an evolutionary failure, but from ignorance and greed. In Amboseli the rhinos have been virtually eliminated, but for different reasons. The Masai consider they have a grievance at the manner in which they have been treated by the government and protest by spearing rhino. The settlement of these griev-

ances probably comes too late to save the Amboseli rhinos which have now passed beyond the point of recovery. Though no individual species has as yet been hunted to extinction in Kenya in historic times, nevertheless there are a number regarded as in danger of complete elimination. In western Kenya some twenty mammal species have been totally eliminated since 1885.

The earliest recorded manuscripts show that throughout the world the mass of people have regarded it as their right to kill the wildlife and have rejected the idea that hunting was the prerogative of a social elite. Strict game bans have been enforced in Europe since the eleventh century. Shortly after the establishment of British rule in Kenya game bans were enacted and poaching was established. Within the first decade of this century serious concern was being felt at the destruction of game by legal hunting and poaching. Until 1903 the Athai plains contained the finest herds of game in East Africa. By 1906 Percival noted that there were tens where formerly there were thousands. Protestations by the then Society for the Preservation of the Fauna for the Empire could well have been raised yesterday. A delegation drew attention to the deterioration of the wildlife situation, pointing out that game provided a considerable revenue in East Africa, far more than was spent on preserving it.

Seventy years later we have cause to complain at the paltry amounts designated for game conservation. For game conservation in 1976 £900 000 was budgeted, less than twenty per cent of the £42 million earned from tourism, and a third of the value of ivory exported to Hong Kong alone in that year – £2.9m a month representing over 18 000 elephants.

Poaching is and always has been, the greatest single factor which has threatened Kenya's wildlife. Organized poaching grew from a mere nuisance to a complex problem in organized crime and with the coming of independence, unable to cope with it, the British authorities passed it on to their African successors. With the increased tourist trade there has been an increased demand for game-trophy products, a demand which has been met by the poachers. The illicit dealer has operated with impunity, and in this context I can do no better than to quote a 1976 report on Tsavo by the late David Sheldrick, warden of Tsavo Park for 28 years: "The illicit dealer must bear the most responsibility for the massacre of the country's wildlife that is taking place. If there was no outlet for tusks, horns and skins, the poachers would not risk hunting dangerous animals such as elephant, rhino, lion and leopard . . . They (the illicit dealers) are well known in the district in which they operate, and nearly everyone is aware of their business, but no attempt appears to be made to make them pay for their crimes . . . There are comparatively few of them and they are all known . . . The only thing that is lacking is an incorruptible, dedicated team of investigators to run these people to earth . . . If the dealers can be eliminated, the entire network will be disrupted and poaching once again would be reduced to manageable proportions." No dealer has, as yet, been apprehended. The position is not improved when it is officially stated that ninety-five per cent of the trade from the game-trophy dealers is legal and the thousands of skins held by them come from government stores.

Since independence there has been a remarkable growth in the national park system, the number of parks has increased from three to fifteen including two marine parks. With the exception of Tsavo Park these are small and represent no more than five per cent of the land area.

In addition, sixteen national reserves have been established and investigation is taking place into where these can be extended. There is, however, considerable pressure on the parks and reserves, with threats of encroachment. None of the parks can be regarded as complete ecosystems. Cultivation on the periphery has cut across traditional migration routes to the sanctuaries and in association with poaching forced larger numbers of animals such as elephant into the parks, with resultant problems of compression and destruction of trees. Visitor-pressure on some parks is causing environmental degradation and disruption of the animals' way of life. It is necessary, therefore, to examine the ecological carrying capacity of the parks in human as well as animal terms.

Assistance in the form of a World Bank loan of \$32 million will enable the Ministry of Tourism and Wildlife to establish three new sophisticated anti-poaching units, to improve roads and amenities in the game areas; to provide a new training school for rangers and wardens and to expand the existing research facilities. In this imaginative and forward-thinking programme all that is missing is direction and management from the top. There has been and still is much despondency about the future of wildlife in Kenya. The destruction of game cannot be attributed to ignorance alone but to greed, cupidity and an indifference to tomorrow.

The extent of the destruction is masked by either official silence or misstatement. Many of those who have been charged with the responsibility of conserving our wildlife have been involved in its slaughter, directly or indirectly.

What is called for is an end to corruption, a sweeping away of the lethargy, and an urgent realization that time is fast running out. The point of no return has not yet been reached. Given the opportunity wild animals will respond remarkably well, but for the more endangered species action is required now. The decline in rhino, elephant, cheetah and all spotted cats, crocodile, zebra and even ostrich is accelerating. A more positive and dynamic approach is necessary and a greater appreciation of the value of wildlife in both economic and aesthetic terms. The crucial question is whether we are poised for a newer and more exciting development in the conservation of wildlife, or for earning the approbation of the world for destroying that to which we have been entrusted – one of the most varied and wonderful collections of wildlife this world has known.

The Need for Wilderness Conservation in the KaNgwane Homeland

E.J. MABUZA

One cannot speak on the need for the conservation of wilderness of a black homeland in South Africa without substantiating such a need as opposed to other pressing needs of the black people concerned. It is the bread and butter issues that count in the lives of our people and the very mention of the words wilderness conservation cannot be made without making oneself irrelevant to the issues of the day. Hunting, for example, was part of the Swazi traditional way of life and our older folk cannot understand why it is that today a hunter is regarded as a poacher. The need for the conservation of wilderness in the Swazi homeland must therefore be viewed against the background of our traditional use of fauna and flora before we came into contact with the white man, as well as against the background of the present homeland concept.

The KaNgwane homeland is made up of two blocks of land, the Nkomazi, Mlondozi, Mswati regions which together border along Swaziland, and the Nsikazi regions to the north-east of Nelspruit. With a total area of approximately 304 149 hectares, it is the second smallest homeland in South Africa. The topography of the Swazi territory varies from gently undulating mountains in the east to a highly mountainous region in the west. The Nsikazi region is undulating but for the Lebombo mountains in the east. Although the KaNgwane homeland has numerous liabilities, its flora, abundant water resources and its scenic landscapes are assets for the development of a tourist industry.

The Swazi traditional way of life was in many ways related to wilderness. Hunting was an important sport and would be organized by the chief or *induna*. Before going on a hunt, elaborate preparations would be made. Men used to smear their bodies with fat to make them lithesome and active. They would chew the bitter bark of a certain tree and spit it out in all directions to ward off the evil spells of enemies that might attempt to bewitch them. Dogs would be made keen by being starved before a hunt. The hunting itself was done in a competitive spirit. The first man to draw blood was declared the owner of the prey. At the end of the day, they would return home chanting hunting songs and report to the chief how many animals they had killed. Game so killed would be eaten without waste. Indeed, *umncweba* (biltong) and stale venison were delicacies.

The witchdoctor depended – and still depends – on wild plants and animals for his herbs and mixtures. Common household medicines are made from leaves and roots. Medicines for self-fortification and protection are made from roots, barks, bulbs and animal powders. It is possible that the witchdoctor who can no longer obtain his mixtures readily may resort to the

only prey which is still available in abundance – man. Hence ritual murders are not uncommon in some of the black territories.

Our costumes for ordinary dress or ceremonial occasions were mostly animal skins. For instance, a leopard had to be skinned at the chief's kraal and its skin was taken by him. The hunter who killed a leopard or a lion would be given an ox by the chief. It was a crime to kill and skin a leopard. Similarly, the lourie bird is regarded as a royal bird whose feathers can be worn only by members of the royal family. Other examples can be mentioned to show how our rich language, idiom and folklore are related to the wilderness with which we had contact.

For the Swazi, the wilderness was the resource on which his very life depended. He regarded nature as having been placed at his disposal for use and not for extermination. With his assegai and hunting dog, it is improbable that he would have exterminated the wildlife in his environment. Then came the white hunter with the gun who hunted with such finesse that our people not only hero-worshipped him but imitated him. Our best so-called hunters today have unlicensed fire-arms. The mineral prospector came with his explosives and the technologist with his bulldozer. Although these changes, to a certain extent, brought about acculturation of our people to the western way of life, they were not aware of the systematic havoc wrought in terms of destruction of game.

The Swazis have been unfortunate in that twenty out of the twenty-two tribes within the homeland, have had to be moved once or twice from one area to another, to comply with the policy of having to settle in areas set apart for them. In most areas where these resettlements took place, there was a rich variety of flora and fauna. Whether it was out of frustration or as a result of disturbed economic existence, they destroyed this rich animal and plant life. It is apparent that this was not done out of vandalism. All that remains today as relics of the rich wilderness are the names of these places like KaNyamazane (the place where game is in abundance), Phiva (the place where the black water-buck is in abundance), Steenbuck, Mbuzini (the place where buck are in abundance). The only name that remains and is still apt is Mvangatsini (Kiaat), where the kiaat tree still flourishes.

Obviously, these technological changes and resettlements have affected the Swazi's traditional attitude towards his wilderness heritage.

It is these changes that made the Swazi look upon wildlife as being there to be killed regardless, because if they did not, the professional hunter would do it much more efficiently. That is why where there are still remnants of wildlife, poaching is the order of the day, in spite of stringent nature conservation laws. Veld fires are caused to facilitate poaching.

Most of the black homelands in South Africa have already taken positive steps towards nature conservation projects. The government of KaNgwane is also giving serious consideration to setting aside a portion of its territory to wildlife conservation.

The basic problem that we shall be faced with is availability of land. Very few homeland governments, if any, are content with the present allocation of land. It will therefore be a very difficult and delicate task to explain to

the people the need for setting aside a portion of their territory for wildlife conservation. Land for wildlife on the one hand in the eyes of the people cannot be reconciled with the need for land for settlement, grazing and agricultural purposes. How can we, in KaNgwane, when we are so land-hungry, penalise ourselves by establishing a wilderness sanctuary?

We are, however, optimistic that the KaNgwane Legislative Assembly and the Swazi people will support this venture which is aimed at restoring part of their lost wilderness heritage. We are also hopeful that the central government will have a sympathetic ear should such a project entail the need for compensatory land for the land which will be used for this project.

It is our dream that this project, when completed, should provide a change for the town and the city dweller who wants to spend a holiday in the countryside. We would like it to offer something different from the Kruger National Park and to be so developed that it will be possible to issue hunting licences; because we know that man has always been part of the environment and will also have to be part of our wilderness. The cropping will, however, be strictly controlled to keep a correct balance and to ensure that the project is economically viable. Perhaps it could include trophy hunting on a very selected basis.

But perhaps we are only dreaming aloud, because such a project cannot be established without patrons and benefactors who will give us the financial backing. It will be necessary to introduce additional wildlife trails and rest-camps will have to be built. Expert advice will be needed not only in developing such a project into an economic tourist attraction, but to restore a lost heritage for posterity.

Economic Problems of Wilderness Preservation

PROFESSOR SCOTT C. WHITNEY

Statistics are frequently misleading and almost invariably mind-numbing. However, a few are necessary to give an idea of the magnitude of wilderness protection activities in the United States. The United States is a large country – comprising 0,93 billion hectares of land. The Federal Government owns one third of this, primarily in the western states and Alaska. Because state and local units of government and Indian tribal holdings are small, most of the remainder or nearly two thirds of the land is privately owned.

Until quite recently Americans have either feared the wilderness or have viewed it as something to subdue and exploit. To be sure throughout American history there have been isolated thinkers such as Thoreau, Emerson, Audubon, John Muir, Theodore Roosevelt and Aldo Leopold who have discerned the unique value of wilderness. Yet it was not until 1964 that Congress, after eight years of controversy, enacted the National Wilderness Preservation System Act to save some lands in perpetuity from expanding settlement and growing mechanization and to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. This Act immediately designated about four million hectares as permanent wilderness. The acreage consisted of fifty-four separate tracts designated variously as national forest wilderness, wild areas or canoe areas. Roads in most cases are barred there forever. With only very limited exceptions no timbering, commerce, man-made structures or motor vehicles are permitted. Existing mining and grazing activities were, however, allowed to continue.

During the ensuing decade Congress added seventy-one new areas to the wilderness system. Significantly, they are located throughout the United States. For example in 1964 there were only four wilderness areas east of the midpoint of the United States (the 100th meridian) whereas by 1975 there were wilderness areas in twenty-two of the eastern states and of course all but one of the Rocky mountain and western states (and Alaska) have wilderness areas. The importance of this decade of expansion is that the geographic, biological and physiographic diversity of the national wilderness system has been greatly increased. Our southern swamps, islands, subtropical areas, great plains and prairies and of course Alaska are now encompassed in the system.

By 1976 the wilderness system consisted of 127 areas comprising 5,3 million hectares and more than 100 additional areas are under consideration. In addition, vast additions of wilderness are highly likely in Alaska once the Alaska Native Claims Land Settlements are completed. Congress will have

made these designations before December 28, 1978. Moreover, although lands administered by the bureau of land management (BLM) of the Department of Interior were not included in the 1964 Act, BLM in 1975 nevertheless designated by administrative decision four areas consisting of 28 350 hectares as primitive areas and the U.S. Forest Services is studying about 25 million more hectares of roadless land in the national forests, and has already selected 274 areas consisting of about 5 million additional hectares for designation by Congress as wilderness areas. It is not unlikely that something in the range of eight to ten per cent of all federal lands will be included in the national wilderness system by the end of this decade. President Carter in his 1977-78 environmental programme announced a multiple wilderness programme which includes expansion of seventy existing areas, five new national park wilderness areas, support for the Endangered American Wilderness Bill which is pending before Congress, and an executive policy directing the secretaries of agriculture and interior to study additional areas for wilderness designation including the eastern national forests, the national grasslands and Alaska.

It is gratifying that the President by executive order has greatly expanded the areas in which use of off-road vehicles such as snowmobiles, motor-cycles and four-wheel vehicles are prohibited.

Another major component of the U.S. effort to protect wilderness is the Wild and Scenic Rivers Act of 1968 which designated all or parts of eight rivers and mandated study of twenty-seven additional rivers for inclusion in the wild and scenic rivers system. The purpose of this system is to preserve designated rivers from dam and other water developments or riverbank developments that would tame or transform them or spoil their surroundings. To be eligible for designation, rivers must have high quality water, possess outstanding scenic, recreational, geologic, historic or cultural values, or unique fish and wildlife resources.

The system deals with three types of rivers – wild, scenic and recreational.

Wild rivers are of course the most primitive, inaccessible and unchanged. Scenic rivers are largely primitive, free of impoundments but they may be accessible by road and have minimal recreational features. Recreational segments are readily accessible, may have considerable development but possess attractive scenery and outstanding recreational opportunities. The objective with respect to the latter category is to use such resource optimally rather than abuse it by unregulated use and development.

Since 1976 seventeen rivers have been designated in one category or the other and President Carter proposes addition of eight more rivers comprising 2 097,8 kilometers and study of twenty additional rivers for designation.

The following three points will indicate several propositions that I ask you to accept:

First, the United States is seriously committed to creation of a large-scale wilderness heritage by laws that are written in terms of land allocation commitments in perpetuity.

Secondly, in the period since 1964 when the first of the two principal

wilderness acts became law the United States has implemented these systems on an immense scale.

Thirdly, not only is significant additional expansion of this wilderness birthright imminent, but regulatory policies and methods designed to protect the wilderness are being improved.

I wish it were possible to terminate my presentation at this point and conclude with the optimistic assurance that five years from today I would be able to report further progress in America's wilderness preservation programme.

However, as early as 1972 it became apparent that the nation's entire environmental reform and protection programme was facing increasingly serious economic problems. Today I think it is fair to say that most perceptive students of environmental regulation would agree that the economic feasibility of protecting and enhancing the environment is the most serious environmental issue we face.

There are three aspects to the problem of whether we can afford the programme of environmental laws we have enacted and these directly impinge on the ability to protect wilderness.

The U.S. has enacted numerous and comprehensive laws to protect and restore the environment. Since 1970 Congress has enacted the Clean Air Act, the Water Quality Control Act, the Noise Control Act, comprehensive pesticide and toxic substances legislation, strip mining controls, endangered and threatened species protection, resource conservation and recovery (the Solid Waste Act), provisions protecting historical, cultural and aesthetic values, protection of marine mammals, estuarine sanctuary legislation, coastal zone management and planning and major revisions in the laws controlling energy generation including nuclear power. This is by no means an exhaustive list but gives some notion of the scope and complexity of our environmental programmes. With no chauvinistic intent whatsoever I submit that this is the most comprehensive environmental programme in the world – and paradoxically that is one of its problems.

As early as 1972 the U.S. Congress recognized that imposition of costly environmental regulations on U.S. manufacturers and business could seriously handicap our ability to maintain acceptable market shares against foreign competitors whose governments have not imposed comparable environmental requirements. Such inequalities in environmental costs were regarded as "distortions" and in 1974 Congress reformed the Trade Act to provide more liberal import relief to protect U.S. manufacturers from unwarranted advantages gained by foreign competitors willing to sacrifice their environment for short term economic gain. The problem of unequal environmental costs and the adverse impact of the U.S. foreign trade position continues to be serious despite the 1974 Trade Reform Act. It has triggered unprecedented protectionist activity in the U.S. and unhealthy tensions between the U.S. and its free world allies.

A second major national problem caused by environmental reform is how to raise the capital necessary to comply with existing environmental laws and regulations. Even if there were no environmental requirements,

economists and bankers agree the U.S., and other developed countries as well, face a capital gap between now and 1985. A capital gap is a shortage of capital investment necessary to achieve acceptable levels of productivity, employment and containment of inflation. It consequently has an awesome potential for affecting the political stability and national security of a nation. A recent New York Stock Exchange study forecast that the U.S. faces a capital gap of about \$650 billion during the period 1975-85. However, this staggering figure relates only to so-called conventional capital requirements and does not include forecast environmental costs. The capital requirements to meet existing environmental laws and regulations is additional to conventional capital needs. The most recent forecast of incremental pollution control requirements for the private industrial sector alone will exceed \$300 billion for the period 1975-1984. This figure is undoubtedly low for several reasons – it isn't adjusted to reflect inflation, it pertains only to five federal environmental programmes, ignoring many other federally imposed costs and omitting all of the costs of compliance with state and local regulations. Thus on an overall basis the U.S. faces the problem of devising capital formation schemes capable of closing a capital gap of conservatively one trillion dollars. Failure to close this gap will produce unacceptable consequences. The business financial planner faces a Hobson's choice – if he fails to allocate capital to finance compliance with environmental laws and regulations ensuing prosecutions and compliance proceedings will only make compliance more costly; if he fails to allocate sufficient capital to assure growth of production the results may not immediately be so dramatic as violating environmental laws, but it starts a broad-scale process of atrophy that will ultimately prove fatal to individual corporate enterprises and ultimately the entire economic system of which they are a part.

The U.S. Congress is considering tax reform legislation to adopt creative methods of capital formation to meet both conventional needs and environmental compliance costs. Whether these will be sufficient remains to be seen.

What has all this to do with wilderness preservation? I have delineated these problems to provide an economic context in which the Federal Government will be operating when it considers important land use allocation decisions that will substantially affect the scope of our wilderness preservation programme for all time. There is only so much wilderness and once it's gone it is virtually irretrievable. Under present land-use laws, millions of hectares of federally owned Alaskan land, the so-called D-2 land, will be classified as to future permissible uses before the end of 1978.

Naturally, reasonable men can and do differ on what portion of this vast area should be "locked up" in perpetuity as undeveloped wilderness area and what part should be allocated to multiple use-resource development. I submit there is no demonstrably right answer to a question of this kind. Such questions are decided by judgments based on subjective philosophical attitudes. On the one hand, the so-called developer school of thought stresses the ominous trends in U.S. consumption of essential natural resources. Consider that only seven years ago the U.S. was self-sufficient in oil and natural gas, whereas today it imports nearly fifty per cent of its require-

ments. Demand for critical resources in developed societies for many other strategic commodities has proven to be more exponential than forecasters realized. There is significant opposition to "locking up" wilderness in perpetuity when access to the natural resources it contains may shortly be necessary to maintain the economy or even to assure national security.

One of the chief obstacles facing additional wilderness designations is that the resulting resource loss is viewed as yet another kind of environmental cost. Unlike environmental pollution abatement costs which are unavoidable because they have been mandated by law, these resource losses in areas designated as wilderness can be avoided by simply opting to limit any further set-asides.

Still another problem is that it is extremely difficult to quantify or even to articulate the value or importance of wilderness to man. The National Environmental Policy Act directs all Federal decision-makers to undertake to devise ways to quantify unquantified environmental amenities and to consider these factors in connection with technical and economic considerations. This is a laudable objective and there is some evidence that Federal decision-makers have to some extent attempted to comply.

However, it is intrinsically very difficult to quantify an intangible environmental or aesthetic amenity. It is particularly difficult to articulate in quantitative terms the value of preserving wilderness. The average American voter is troubled by the paradox that wilderness ceases to be wilderness if any significant percentage of the population enjoys it. By definition, if anything more than an infinitesimally minute sector of our population sets out to enjoy wilderness it ceases to be wilderness. Most of our national parks today face a severe public over-use crisis. Immense traffic jams and severe resulting air pollution are commonplace in some of the most scenic parts of our country.

In the case of wilderness these environmental problems are precluded by regulations prohibiting construction of roads or human structures and by prohibiting use of off-road vehicles. Necessarily these wilderness preservation provisions operate to confine wilderness enjoyment to significantly smaller numbers of citizens than the national parks, forests and recreation areas. Consequently wilderness preservation has a very small constituency. It is therefore easy to label wilderness preservationists as elitists, and a rather minute elite at that.

Anyone concerned with wilderness preservation must recognize certain hard facts of life:

First, economic well-being, financial security and an improved standard of living are the overriding concerns of most Americans. They will not long tolerate policies or programmes which endanger economic stability and growth.

Second, most Americans show no disposition to comply with conservation measures which involve reduced consumption of energy, fuels and other non-renewable resources.

Third, wilderness preservation would rank very low in the scale of environmental priorities of American citizens. I believe all but a tiny elite of

wilderness buffs would rank air and water pollution and the other ills that directly affect the quality of their daily life as being far more important than wilderness preservation.

Fourth, there is a growing public awareness that protecting and enhancing the environment is immensely costly and that we would be well-advised to reassess our situation to determine how much environmental reform we can afford.

Finally, in any test of strength between public concern about the economy, or its ability to satisfy the demands of the American lifestyle, on the one hand, and wilderness preservation on the other, there would simply be no contest.

We have already made great progress in the U.S. in preserving immense areas of wilderness and wild and scenic rivers. Further progress and increased wilderness area set-asides will, in my opinion, be achieved in the next few years. However, ominous economic trends and resource shortages will almost certainly severely constrain environmental reform and wilderness preservation in the near future. As world population grows, as the populations of the developed countries and the emerging countries demand higher living standards, great pressure will be created to stop wilderness set-asides and the day may not be too distant when political forces responsive to economic pressures may try to "unlock" wilderness regions containing critical resources.

Towards a New Philosophical Attitude of Man to Nature

JEAN DORST

It is well known that a number of major civilizations of the past, which left only scattered ruins in the middle of deserts and wasteland, vanished for ecological reasons. After shedding brilliant light for centuries, they expired under the combined effects of gigantism, bad land use and excessive pressure on the habitats from which they drew their subsistence. In some ways they died victims of their own success. The history of the Maya Empire, of the Khmers and of several civilizations in north-western India bears strong witness to this fact.

Has not our industrial civilization, of which we are so proud, reached the same fatal stage of irreversible senescence? Its unmatched scientific and technological successes may well have encouraged man to be over-ambitious in applying worldwide a few formulas suited to certain circumstances but which are inadequate for the rest of the world.

Some three centuries ago our technological civilization was still in its infancy. Within this brief period the most profound change in human history affected man and his way of life. Progress took on a new dimension in western Europe during the eighteenth century. Suddenly man, a wretched creature among many others, disposed of a formidable quantity of energy, a fact which entirely changed the scale of human impact. Discovery of new types of engines using the energy of fossil fuel was comparable to a geological phenomenon. The political, economic and sociological consequences are incalculable and even more significant ecologically. The increase of human influence over nature is obvious in two different ways. The harvest of natural resources had increased at a tremendous rate. Secondly the enormous quantity of available energy allowed men to undertake enterprises impossible even to imagine a short time before. This increase is noticeable even at an individual level, measurable at the rate with which any citizen living in our developed countries uses goods. Our economic and political stability is based on a continuous expansion. Because of the present crisis, rate of expansion is much slower than a few years ago – and this we find depressing, for we are still convinced that expansion is the only solution to all our problems. In fact no biological or economic process can be based on a continuous increase. Any phenomenon is sooner or later limited by negative factors and well defined feedbacks which control the system and tend to bring it back to its initial stage. Any mathematician is aware of the impossibility of including parabolic curves within a closed envelope. Why should human activities be the unique exception to this general rule?

Of course this excessive and expanding consumption is particularly spectacular in developed countries. We are using energy for unimportant ac-

tivities – not only to lift us to upper floors but to open doors, close windows, brush our teeth or polish our shoes. In any article the plain product represents only a small fraction of the total price; the rest meets the expenses of fancy packages made to attract and satisfy consumers. Such a practice would be harmless if it did not denote an additional waste of raw materials and energy.

Citizens of developing countries also strongly desire to share in this venture. It is perfectly legitimate that they wish to increase their standard of living. However, they also want to possess the useless toys with which we already play. (Should we stress that often at great profit to themselves dealers from industrial countries incite poor people from the Third World to buy such items as a priority and a symbol of success?)

Unfortunately such a policy cannot be followed for long. Even now it would be materially impossible for everyone throughout the world to obtain what is at the disposal of a middle-class citizen of one of our developed countries. The reasons are obvious. We have not enough raw materials and not enough energy to process such quantities of goods.

These considerations should be scrutinized in the light of the increase in our human population, or even the present demographic explosion, probably the most important parameter in modern times. This is where the main challenge of our century and of the next lies as we cannot expect much improvement within the next three decades. If this problem is not solved in a peaceful and efficient way it is simply pointless discussing problems of conservation.

In short, at present our industrial civilization is expressed by a number of exponential curves, from the increase of human population, that is of consumers, to that of the quantity of goods they use and of the energy required to produce them. Many observations have been made in this respect. I shall mention only those of the Club of Rome. We obviously need to be very careful when we argue such matters, as new discoveries will probably change the parameters of all our current problems in the near future. As in the past, and probably at a higher rate, our technology will experience profound changes and consequently render futile any attempt to predict the future according to the past. It has been said with some humour that if the Meadows report had been published in prehistoric times, it would logically conclude that men would rapidly be short of silex, according to the trend of the consumption. Nevertheless such prospects contain a grain of truth. Our industrial civilization betrays a critical disparity between what man requires and what nature provides. This disharmony increasingly indicates a sharp imbalance between man and the vast assemblage – the biosphere and the lithosphere – from which he draws his raw materials, energy and subsistence. It can be advocated as one of the main causes of the present crisis of modern civilization. Man spoiled the earth, like an engine turning at an excessive rate. Perhaps he harmed himself at the same time.

The effects of these intricate factors may completely ruin our present civilization, at least in its present state of excess. What happened to past civilizations which vanished, apparently for political and sociological but funda-

mentally for ecological reasons, may happen to us. However the situation is now much more serious – for man has the power to eradicate his own kind, and with tremendous speed and energy. Moreover an eventual collapse would involve the entire planet over which industrial civilization is now widespread, and not only a limited area outside which the natural capital would remain untouched.

It is obvious that we must urgently remedy the situation and find various original solutions to the most serious challenge of all times. Without any doubt, a number of problems can be provisionally solved with our scientific and technological knowledge. But we should be convinced that no durable solution will be adequate, if above all we do not fundamentally change our philosophy in regard to nature and establish it according to sound ecological principles.

Industrial civilization is the offshoot of a way of thinking according to which man is the very centre of the world, its master and tyrant. Materially, our technology has developed from application of scientific knowledge accumulated at an increasing rate throughout centuries. On a higher level, it is governed by a conviction of the unmatched supremacy of man over the rest of the planet. Among the major principles three seem fundamental as they involve a series of corollaries and innumerable consequences: a disdain and even a contempt for all which is not produced by our hands or brain; the myth of the inexhaustible riches of nature, which we can use and abuse at our leisure; and a stubborn confidence in our science and technology, which presumably can substitute for nature.

Our primary motivation is an indisputable disdain for nature. During the Neolithic period man invented agriculture and pastoralism. Progressively he created an artificial world from which for ten thousand years at least he has drawn an ever-increasing proportion of his food resources. In addition to the biosphere there now exists an anthroposphere, or perhaps a technosphere. Man lives in large cities, away from nature. Most of his problems are tackled with his technology and any solution apparently can be found through his research and his own genius. Through such thinking the biosphere has rapidly taken on the appearance of an out-dated object, of no further use. We easily scorn what is of no use to us. It is well known that air, water and land are spoiled by numerous poisonous substances which kill animals and plants and paralyse biological processes. Beyond any biological considerations, we should emphasize that our attitude betrays above all a true disdain for nature. Marshes and other wetlands are just good for keeping filth in and many little towns adopt them as public discharges. Used cars are abandoned along small roads in the middle of scenic landscapes. Everywhere the last refuges of wildlife turn into depositories of the wastes of our industrial civilization.

Moreover man still behaves aggressively towards nature. To pick flowers and let them die on the road seems just futile; perhaps they have no value for us because they were given free. Nature is not quoted at any stock exchange except if it can be added to the assets of a ski or summer resort. Possibly we are not yet liberated from the outmoded complexes of our ancestors of pre-

history or the middle ages, when nature was an enemy to fight more than a mother providing riches. We act as if we intend to expunge the marks of the past and take some revenge on nature. A wide gap exists between the level of our science and technology and that of our psychology.

That the earth's riches are inexhaustible seems to be another idea ruling our thinking. This myth – as old as the hills – gained new strength after the great discoveries and the industrial revolution. Some economists stressed this idea, like Ricardo who speaks of the "imperishable and indestructible faculties of nature." Much of our behaviour may be explained in terms of such an attitude. Often, for example, the pressure of hunting is too heavy, as man overestimates the importance of game populations, especially in many European countries where the amount of hunting now greatly exceeds the capacity of reproduction. Seas are still over-exploited as the need for food, above all protein, is increasing rapidly. Though immense, the biomass of marine animals including fish has precise limits. Over-fishing is a plague all over the world, particularly on the vital continental plateaux. Crustaceans and molluscs have been over-exploited in the same way, and evidence of the tragic story of the big whales is ever present.

Several other resources have been overestimated simultaneously. Water seems to be extremely abundant but only point six per cent circulates through the water-table and the volume of running water is negligible. The enormous use by plants is a main part of the hydrological cycle. But this cycle is being affected by man, and human usage in industrialized countries is even higher than the needs of nature. From 300 to 600 kilograms are required to produce one kilo of steel or of nitrate fertilizer. Conflicts already exist between the various human needs and the stability of the hydrological balance. Water provides the best example of a difference between the total quantity of a resource, which can be enormous according to the human scale, and the small part we may use without initiating a rupture of balance and eventually the collapse of the whole system.

Soils are in a similar plight. For centuries the best soils have been used for agricultural purposes and turned into pastures, fields or artificial forests. In our time there are still some areas which could be transformed in the same way. However pedologists warn that their extent is very limited. Yet, all over the world in developing countries wild habitats are still converted into agricultural land. Vast projects are undertaken in dry areas, which are irrigated by huge systems of dams, and among humid tropical forests, the true land of illusion. Opening up of new land, so frequent in Africa, South America and South-East Asia, is politically most attractive for governments since it means the transformation of useless bush into rich fields or pastures; it involves the financial support of international or foreign aid, and affords international recognition to the politicians. But economically such operations are extremely costly and most of them never return the invested money. Ecologically they are simply disastrous, not to speak of the social and human consequences. Most of these projects, highly fashionable among international circles, are undertaken on marginal land which will never give sustained production, for various reasons. Without doubt land misuse is the greatest

threat as it leads to the destruction of the capital itself. Man still believes that any piece of land can provide all the wealth he needs, especially in the tropics where vegetation is lush, and sun and rain are over-abundant.

The third conviction is an unlimited confidence in our technology. We have increased our knowledge of physics and chemistry astonishingly, and more recently of biology. All these sciences opened the doors to an artificial world. It would be silly not to recognize that our way of life has been enormously improved. In spite of all the difficulties and nuisances, life is easier now than at the time of our ancestors. We should not forget this.

Man has an unlimited confidence in his power. He believes he can do everything, even correct the excesses of his technology by yet other techniques, without fearing any harmful feedback or additional waste of raw materials and energy. Progressively a Promethean order is replaced by a Jupitan one. Man imagines that he is strong enough to break every link with nature and live in a world and from products made only by himself. Therefore why protect nature and natural resources? Our primary errors certainly originate from these three ideas. Like civilizations now extinct forever, we believe that we can dominate all ecological restraints and lead our affairs according to our own rules. This is what we have to condemn. The French entomologist J.H. Fabre, declared decades ago that "man will die, killed by the excess of what he calls civilization." This prophecy seems more and more likely to be fulfilled.

We have to convince ourselves that we are living in a finite world, on a finite planet, in a fragile symbiosis with the rest of the biosphere. Some progress in this direction has been made. And in some respects our efforts have improved the situation. However, no appropriate plan of management of mineral and renewable resources on a long-term basis will be put into practice if we do not entirely revise our philosophical attitude towards nature.

We must, therefore, urge our philosophers to propose the principles with which we could fundamentally improve our industrial civilization, one which even in its most material sense is the consequence of our way of thinking. A thorough analysis of the various philosophical systems born in the Mediterranean and in western Europe, which later spread throughout the world, demonstrates that no one has been able to induce a true respect for the natural asset from which we draw our subsistence. Neither the idealists nor the materialists have expressed the necessary principles from which there may result the concept of protection of nature and of the close links between man and wildlife. Instead they emphasize the instinct of domination of a species believing itself to be superior to the rest of the world which is subservient.

The Bible states that man should "fill the earth and subdue it; and have dominion over the fish of the sea and the birds of the air and over every living thing that moves upon the earth" (*Genesis*, 1,28). Christianity puts man at an incomparable level. He is made in the image of God. Rejecting the idea of evolution, through which man descended from a common biological stock, Judeo-Christian thinking praises the superiority of man.

It is fair to say that more recently some thinkers have tried to integrate

the teachings of science and those of faith. Ecology and theology have been discussed in close connection to give another dimension to both. All these loyal attempts are bitterly disappointing. Some agreement recognizes the value of nature; nothing is said about its right. Nature does not exist outside man. Perhaps more fitting exploitation of earthly resources may result from such convictions. But a deep revision of the relation of man to nature will never be stimulated by such thoughts.

A similar attitude affects occidental thought outside Christianity. The supremacy of man has been proclaimed since classical times. Pantheism and belief in numerous deities living in springs and woods could have constituted a base for man's respect of the integration with nature. The myth of Prometheus has great significance in this respect. By his particular skill, man conquered a power which made him equal to the gods, and consequently he went into conflict with them. Since ancient Greece, man and nature have been separated like spirit and matter.

Much later, after the Middle Ages and Renaissance, nature assumed another aspect. Science developed its pragmatic bias. Men of science and philosophers, Bacon, Descartes, Galileo, Gassendi and many others later like Kant became masters of a new epoch, the prodigious century when modern science was born. They created a methodology to investigate the mechanisms of nature, to explain them, and later use them for the benefit of man and thus to dominate nature. A second world within the world of nature or even outside it was progressively to take its modern dimensions. Francis Bacon proclaimed that man is made to manipulate nature. Descartes affirmed that we should become "masters and possessors of nature." Nature had its own laws, with no relation to man who could therefore conquer it. Some time later man became an engineer, no longer obliged to respect the moral value of nature, since he recognized only its material characteristics. Nature, already abused and mistreated by Christian thought, was to be completely desecrated in the west.

Such concepts still persist and they constitute some of the common denominators of all our philosophical systems, as contrasting as they may be in other ways. Friederich Engels declared in his *Dialectics of Nature* that "it is precisely modification of nature by man and not nature in itself which is the immediate and essential base of human thought." A Christian thinker like Paul Claudel is not far from this opinion when he points out that "man has been made by God in the middle of nature to achieve it and to offer it to Him."

Some philosophers with naturalistic sympathies were able to influence this current of thinking. Jean-Jacques Rousseau is one of them and certainly he made real efforts to return to a nature which was not for him simply an object of study.

The German *Naturphilosophie* may also have encouraged a better understanding of nature, but with little effect as such views were in strong opposition to the general trend of western thought. All western philosophies are generally in strong contrast with the oriental ways of thinking. Most major eastern philosophies strongly insist on a close integration of man and nature.

The entire universe is part of God and should be respected as such. Certainly man is unique, but he is merely a part of the nature from which he proceeds and in which he belongs. In this respect there is a fundamental schism between eastern and western thinking.

For two thousand years or more, western man has been convinced of his own superiority. Science gave him the power to convert his dream into reality. Man was apparently the master of the world.

Now we see that we were wrong, that we accumulated errors of every possible kind and that we cannot rule over nature without following its dictates. And we realize that our technological civilization was not mastered by ethics proportionate to our power.

We can discover technical devices to fight pollution, take measures to protect some areas from human impact and refrain from spoiling our environment. We can even try to manage our natural resources better.

But nothing will really change if, above all, we do not radically change our philosophy. We cannot simply adopt eastern attitudes as some idealists have tried to do. It is our own vision of the relationship of man and nature that ought to be entirely revised. We must find a way of thinking under which the particular status of man is preserved, but where he is integrated within a vast system, the elements of which are linked to him by something other than a predator-prey relationship. Who will develop the basis of this system? Philosophers, theologians or ecologists? Probably all of them, but someone must take the initiative. For only then will our constructive efforts to protect nature and reduce the harmful effects of our actions meet with real success and renew our civilization, the end of which would mean suicide for mankind.

Nature Conservation: The Dilemma of Developing Countries

NORMAN NAPO RADITAPOLE

We are now obliged to consider the future of man's renewable natural resources not only at a time when certain areas of the continent of Africa are in turmoil, but also during a decade when humanity is faced with innumerable crises which call for, and indeed demand, that choices be made for better or for worse.

All of us share a common concern for the future and welfare of mankind, the preservation and conservation of natural flora and fauna and the physical environment in which man lives.

Coming from one of the smaller developing countries of Africa, the mountain kingdom of Lesotho, and having lived most of my life in this sub-region, I cannot speak for developing countries as a whole. But I shall attempt to highlight some general problems which face some of our developing countries. I will not offer specific solutions as to how these problems can be solved, as circumstances and conditions differ from country to country.

Over the past thirty years or so, persistent attempts have been made by experts at national and international forums to draw the attention of governments and nations to the problems of population growth and food production. The United Nations agencies specifically charged with finding solutions have published report upon report, convened conference upon conference, appointed study groups one after another – the list is endless; but where do we stand today since the founding of the Food and Agricultural Organisation (FAO) of the U.N?

We are told that we desperately need more food; not only to feed the human beings whose number is increasing every day by about 200 000 but also to carry buffer stocks for use during times of natural disasters such as droughts and floods – the Sahelian zone famine disaster must still be fresh in our minds.

The diets of an estimated one point five billion people range from barely enough to very inadequate: many millions are often or always on the verge of starvation. The recent UN World Food Conference received a conservative estimate that nearly 500 million people are permanently hungry and protein intake is thirty per cent below normal bodily requirements. The FAO has estimated that world cereal needs alone, protein needs, will be 703 million tons greater in 1990 than in 1970, an increase of 58,3 per cent. Many of our developing countries are trying hard against tremendous odds to meet our food deficits, but one of our problems is the scarcity of arable land.

Productivity on existing land can be increased, but how can we in the developing countries achieve this amidst the chaos of the present world

economic order? Unless stability is reached soon to make it possible for our countries to acquire the necessary means to increase productivity and receive fair prices for our primary commodities on world export markets, many of our governments, much as they would like to conserve and preserve nature for posterity, will find and are finding it difficult to resist the people's demand for more land for agricultural purposes at the expense of national parks, wilderness and other conservation areas irrespective of the purpose for which those areas were set aside.

No administration can persistently resist and ignore the voice of the people when they demand more land to grow more food; this is one of the dilemmas facing our countries and nature conservationists the world over. In many of our countries the problem is further compounded by the need to provide land for the landless – no government can sow the seed of its own downfall for the sake of nature conservation alone. Land-use involves political considerations which may not be appreciated by those not closely involved in decision-making at the policy-making level.

The sixties saw a scramble in Africa; then, it was not by outside but by internal forces seeking independence for their people in their respective countries, whose boundaries had been determined by metropolitan powers at the Conference of Berlin as far back as 1884.

As is well known, Africa has a rich heritage of wildlife. Before and after the independence era, there were many prophets of doom who predicted a complete destruction of fauna and flora in different parts of Africa, yet we know that this has not in the main happened. Many countries have made an effort to preserve and conserve what had been established during colonial days; government departments whose duty is to preserve and conserve flora and fauna have been maintained and in some instances enlarged or strengthened as far as funds and personnel would permit. This has happened because, apart from the tourist trade and the economic benefits accruing from it through an inflow of much needed foreign exchange, the new nations could, for the first time, enjoy the amenities provided in national parks and recreational areas following the removal of discriminatory practices.

I am not suggesting by any means that all is well – but thanks to the commendable efforts of organizations such as the International Union of Nature Conservationists, the World Wildlife Fund, subsidiary bodies and other organizations, the ideology of conservation has taken root and will be difficult to dislodge so long as we are realistic in the demands the conservationists and enthusiastic nature-lovers make on our governments. We must be objective and get our priorities right. To expect a starving man not to poach or a cold man not to cut down a rare tree or bush for firewood is to say the least, to expect the impossible.

I do not believe that we in the developing countries are as unappreciative of nature as we are sometimes made out to be. If we were, our countries would not have been appealing to the international community for assistance for the conservation and preservation of our national heritage for the enjoyment of all.

I have already mentioned some organizations which are giving assist-

ance in nature conservation to many countries; other aid comes from international organizations under multilateral programmes, from other governments under bilateral arrangements and from private individuals. I must admit that in certain cases the aid has been misused or indeed wasted. It is therefore absolutely imperative that both donor and recipient should work out a well co-ordinated plan so that projects do not fail because of the departure of expatriate personnel or lack of funds in the national coffers. Above all, the plan must include training of local personnel at professional and technical levels, ensure that education on nature is not neglected in schools and that the populace is made aware of nature.

The continued existence of parks, wilderness and other related areas, or the establishment of new ones, depends on the political will and national priorities set by governments.

An immense amount of work is being done by the Southern African Regional Commission for Conservation and Utilisation of Soils, a body of scientists which with its various sub-committees makes recommendations to member governments on this very complex and sometimes thorny question of land-use of which wilderness is but a part. It would be a sad day for this sub-region if this body should die for lack of support from member governments for reasons unrelated to science.

Only through such international bodies which are an example of technical co-operation can we hope to solve our dilemma. It must not be assumed that the inhabitants of this continent – especially those who are poor – do not appreciate the universal nature of the instinct to survive, the impelling pressures from our children for a higher standard of living than we their parents are enjoying, and above all improvement in the quality of life for the majority.

International conferences normally produce a plethora of clichés: we hear of the rich and the poor nations; we hear of the underdeveloped – lately referred to as the developing – and we are now referred to as Third World countries (though no one has yet indicated what has happened to the “second world countries”).

Where and when are classifications of nations going to end? We from the “least developed countries”, the L.D.C.’s, are concerned about whereabouts we will end on the “richer side of poverty or richness.”

The gap between the rich and the poor is widening. Nations are unable to make a choice between existence and survival. The outlook would be very bleak indeed if we did not continue to hold dialogue on the conservation of nature, of which we, *homo sapiens*, are part.

A View from the Third World

FELIPE BENAVIDES

Perhaps our great cause, conservation, suffers from too many words and not enough action. In issuing our reports, memos, drafts, edicts, and outlines we must have been responsible for destroying a great deal of forest wilderness. So let us remember that actions speak louder than words.

South Africa has led the world in the conservation of wildlife and wild places. Over 100 years ago Paul Kruger had the inspired idea of setting aside the large area of wilderness which now bears his name. Recently this country pioneered new ways of capturing and transferring larger mammals by drugging and other methods, in which Ian Player took a leading part. In view of the traditional fieldcraft skills of the first settlers and the latest South African scientific and medical techniques, it was highly appropriate that the first World Wilderness Congress should have been held in South Africa.

In Peru for over twenty-five years I have been a voice crying (some of my detractors would say bellowing) in the wilderness about the need to look after it and not squander it as has been done so tragically elsewhere. To wantonly destroy wilderness is like demolishing a great cathedral in order to grow potatoes on the site.

As man multiplies unchecked, thousands of acres of wilderness are being absorbed into his concrete jungle and posterity is being robbed of a precious inheritance. Man must stand still, take stock and demand that a halt be called to the genocide of the wilderness – failure to do so will result in his ending up naked, starving and not a little mad in what remains of the wilderness, crying out (to whom?) that the remedial action was too little, too late.

In the Third World we are truly grateful for the help we have received from the developed world in the form of money, equipment, scientific advice and moral support. Yet we are growing weary of the eloquent messages and edicts we receive – especially from those who have little wilderness left to destroy – urging us to conserve our wilderness. We will need your help for many years, but more urgently in a different way. We have made laws to protect our wilderness and wildlife but they are of little effect unless you pass your own laws to give real support to us.

In my country all animals on the Washington Convention of Endangered Species list are protected. Stiff penalties in the form of heavy fines and imprisonment are imposed on law-breakers, and yet it is worth the risk of being caught because there is a demand abroad for the stolen goods. If that demand were to help mankind in some way – to cure some of man's killer diseases for example – then it would be justified and it would become necessary to breed stocks in captivity. But the demand is the disgraceful one of human vanity and the luxurious pleasure of a few pampered, unthinking people.

For example, the drain of wildlife within the Third World is causing the destruction of a vital food chain much needed by those nations which seem to sink into greater poverty day by day. On one hand the uncontrolled increase of population, and on the other hand considerable decrease of animal life and of a renewable source of protein is bound to cause a serious state of hunger, chaos, disaster, and through this starvation and death. Indeed this population explosion poses a more serious threat to mankind than atomic warfare.

The over-fishing and over-whaling which some nations still permit is a grave matter for the survival of our seas. Marine science has not yet been able to justify mankind's present destruction of huge shoals of fish in all our oceans. Large fleets equipped with ultra-modern electronic techniques have the power to remove massive quantities of fish at the expense of the poorer nations. Let us be honest and look at the flags of ownership of those modern fishing vessels. Let us also look at the destiny of the fish caught. As a Peruvian I am well aware of how an incalculable renewable oceanic wealth has been misused in the past, with the anchovy and now the sardine. This was because of the economic needs of Peru, but the greed of a few was responsible for this massive destruction of protein. Most of it ended up in the industrialized world market to feed cattle and poultry – in fact among the very nations that are better fed. We became the first fishing nation in the world and what are we today? We see the same story repeated in the use of many other renewable protein products.

In the past the demand for timber partly destroyed our rain forest. Demand for contraband skins, as in the case of vicuna, nearly destroyed forever the finest wool in the world. It has now been proved that not only have we preserved the species in Peru from a mere 5 000 to about 45 000 at present but we expect by 1995 to have a population of at least 250 000 vicunas living and feeding in the high Andes and giving work to many hundreds of our poorer countrymen. Yet, in spite of our rigorously enforced protection laws the contraband traffic still persists through the demand for luxury of such wealthy countries as France and Italy. The United Kingdom and the United States stopped those illegal imports over five years ago, but other countries still persist in obtaining an illegal product, and by doing so have caused the death of some of our game guards.

Is that fair? Because of the mere need of a few, the lives of human beings are put at risk, and in some cases for luxury, the survival of the species we are trying hard to protect for the benefit of the many is endangered. I accuse the industrialized nations of this frivolity, and for the unfair pressure they bring upon the Third World countries. As well as the food chain, another sort of chain seems to exist. It is the sinister chain made up of poachers, trappers, transporters and intermediaries linking the catching or killing with the wholesaler and the expensive shops which first create the demand and then satisfy it. In some cases this trade is legal and if it benefits animal survival and man's existence we shall indeed encourage it, but when it endangers species then it becomes a criminal offence. Criminal because it is against the laws of the country that protect the rare species and because it encourages the

illegal killing of those species by the demand for those skins, ivory, wools or whatever. Exhibited at some of the most expensive and exclusive shops whether in Buenos Aires, Nairobi, Paris, Hong Kong or Rome, such merchandise is a criminal encouragement towards the extermination of such species as huanaco, Grevy's zebra, vicuna, elephants and the spotted cats. I have ample evidence of what I am saying. For example, we wrote to the President of France last year begging him to help us stop the sale in France of vicuna products. After six months we received an answer stating that after an investigation it was found that only products of llama and alpaca were sold but not vicuna. We wrote back giving the name and address of the famous shop, Dior, where vicuna cloth is still sold today.

I wonder what sort of investigation France uses for this sort of enquiry when in less than one day an ordinary Peruvian citizen can find all the evidence needed? Criminal encouragement? Is the word criminal too strong to be used? Let me quote H.R.H. the Duke of Edinburgh, president of the British section of the World Wildlife Fund: "All living things are entitled to a share in this world and if they vanish forever our successors will have every right to blame this generation for criminal negligence."

But alas, we of the Third World, crying in the wilderness and bitterly complaining of our poverty are no doubt partly responsible for our misfortunes, because we do not always respect our own laws or care for our own renewable resources. We complain of our poverty and sometimes blame others for it, although we are surrounded by natural wealth. Sometimes we go as far as trying to harvest or grab the work and sacrifice of others. Perhaps one of our great tragedies is the misfortune of being unable to enjoy political stability and thus continuity in good management. The key to progress and a good standard of living irrespective of politics, race or religion is efficient management and not empty words or offers. Nevertheless, our wealth is often abused by the demands, political pressures and greed of the wealthiest nations.

I am shocked and outraged when I work out what price we receive for some of our wildlife, whether alive or as derived products. The prices they fetch in luxury shops even allowing for freight, manufacture and other costs represent a profit beyond belief. No doubt the poacher whose illegal action is in no way justified takes terrible risks – he may be shot by guards or receive a severe prison sentence. Nevertheless, due to his own poverty, the temptation is too great and he risks everything while the trader sits complacently in his comfortable office or shop. Is this a good educational example to set the poorer nations? Is it a coincidence that eighty per cent of such traders in Latin America are Europeans?

Recently in Peru I witnessed a sordid example of how outside influence can obtain permits to hunt rare species which are on appendix one of the Washington Convention – not for scientific or medical purposes but to satisfy the sick whim of a rich collector. Sir Peter Scott commented on this case: "Many people feel very strongly that trophy-hunting of endangered species is ethically unacceptable and when it happens it is bound to create a considerable stir."

Within the spirit of the Washington Convention there can be no such ex-

ceptions. The convention must be respected by every civilized nation and every civilized man, otherwise sooner or later – and I suspect sooner – the destruction of nature will bring massive famine to the world. Despair and chaos will make man run amok and in his blind panic will bring down our civilization. During the last century man has been most technologically imaginative and he has not only reached for the moon but actually walked on it. During the same period he has used these same skills to destroy much of his own spaceship – earth, his only habitat in the whole universe.

Papua New Guinea's Wonderful Wilderness and Unique Wildlife

ERIC BALSON

The island of New Guinea lies one hundred and sixty-one kilometers to the north of Australia. It is the second largest in the world after Greenland and many would hold that it is the most beautiful.

The eastern half of the island is the independent state of Papua New Guinea which gained its independence from Australia in September 1975. The western half forms the Indonesian province of Irian Jaya. Under the yoke of Papua New Guinea there are six hundred adjacent islands with a total land and sea area of 2,2 million square kilometers. Lying solely within the tropics it is a land rich in fauna and flora with habitats ranging from the romantic coral atolls and islets of the south-west Pacific, through the humid lowlands of sandy beaches, swamps and evergreen jungles, to snow-capped mountain peaks of up to 24 000 kilometers. With a land area of forty-six million hectares there is forest cover of forty million hectares, and of this only eight million are considered accessible and suitable for development.

It never ceases to amaze me how one can fly for hour upon hour over dense evergreen forests and swamps. A multitude of rivers dissects New Guinea's terrain into islands of isolation. Enormous muddy rivers boil with turbulence during the rainy season and are hardly much tamer during the dry spell. The two biggest and most important rivers are the Sepik and the Fly, with their sources in the Victoria Emmanuel range. They meander north and south in opposite directions. Both are navigable for eight hundred and five kilometers and yet stretch a further three hundred and twenty-two. The average rainfall is two hundred and three centimetres with some areas receiving up to seven hundred and sixty-two centimetres. Motorable tracks are scarce throughout Papua New Guinea, and one has to go on patrol by foot, boat or air: in many isolated areas the inhabitants have never seen a motor vehicle but know what an aeroplane is. There are some two hundred and fifty airfields throughout the country.

One of my first impressions of Papua New Guinea was the apparent total lack of wildlife – except for snakes which are seen on every road, especially at night. In real contrast to Africa one can motor for one hundred and sixty-one kilometers which is about the extent of the roads, in and around the capital, Port Moresby, and see only a few birds. However elusive the fauna seem, if you amble along quietly with your eyes and ears alert, you will soon become part of the forest life and observe fauna taking up their unending search for food and survival.

Much of the wildlife of Papua New Guinea is quite unique and peculiar to that country alone. There is still much undiscovered as research scientists have barely scratched the surface.

Papua New Guinea came into contact with the modern world very recently. Virtually no Europeans settled on the islands before the eighteenth seventies, and it is only within the last few decades that western development has made any significant impact on the wilderness. It can be classified as one of the world's last unknown, so it is understandable that the tribal customs and traditions have not changed since ancient times. Squabbles flare up over boundaries and ancestral hunting grounds, feuds occur over what appears to be trivial and last for weeks, sometimes months. Arrows and spears are the main weapons and are used without hesitation. Their quills are taken from the long-beaked *echidna* or spiny anteater, a small egg-laying mammal which is unique to Papua New Guinea, and attains a length of 76,2 centimetres. Head-hunting was previously practised on the island but has been stopped by the government.

There are three million natives of diverse physical types, mainly of Melanesian origin. Through the inaccessibility of the terrain and lack of communications, tribal warfare forced isolation upon the people. More than seven hundred languages and dialects developed and the diversity of these languages is bewildering. A language used in one village is quite unrelated and unknown to another village a few miles away. The official language is English with Pigeon and Notu taking second place. On the coast and rising hinterland Papuans live in hamlets and villages often on the crest of ridges and on hilltops, a defence precaution. The spectacular birds of paradise are a group unrivalled in plumage and display. Of the forty-two species that exist today, thirty-three are peculiar to Papua New Guinea, seven are found in Irian Jaya, and the remaining two species live in north-eastern Australia. The indiscriminate slaughter of these splendid birds for their plumes at the turn of the century instigated strict legislation to prevent the exportation of their skins. Only traditional hunting methods such as bows and arrows may be used by the indigenous people, but the shotgun is rapidly taking over and must be controlled before this unique heritage is lost forever. Nothing transcends the beauty and brilliant colour of the male's display at its height – some hang upside down while they show their beautiful plumes to the female. Their magnificence has earned them royal titles such as Count Raggi, Emperor of Germany, Queen Carola, and King Bird of Paradise.

The parrot and pigeon families form an important group of birds in Papua New Guinea. The three largest pigeons in the world occur in New Guinea island. The Victor Crowned Pigeon is the largest and most majestic of this group. Gregarious parties of these rare lacy-crested birds wander through the forest and swamp lowlands, feeding on fallen fruits. They are about the size of a full-grown hen turkey. Eighty-six species of beautifully coloured parrots and lorikeets live in New Guinea. This black cockatoo or palm cockatoo is the largest of all cockatoos and has naked cheeks that blush red when excited.

Cassowaries are a status symbol in many areas of Papua New Guinea, so are the megapodes, which probably evolved in New Guinea and build incubators instead of nests. The hen builds a huge mound from earth, leaf litter and forest debris which gives off heat as it decays. The birds dig tunnels to

the centre, lay their eggs – usually between six to twenty-four – close the tunnel and then abandon the eggs. Incubation is as much as sixty-five days, the longest known in birds. The chicks claw their way to the surface and are able to fly as soon as their feathers are dry. These young birds are completely independent of their parents. The brush turkey belongs to this group, as does the scrub fowl. There are several species of kingfishers and about 6 000 species of moths and butterflies. Most of the birdwing butterflies are now protected. They are the largest in the world. Alexandra's birdwing has a wing span of twenty-seven centimetres. Papua New Guinea is the home of another of the largest species of the Hercules moth.

The warmth of the tropics provides an excellent environment for reptiles. The taipan, one of the deadliest snakes, belongs to the same group as the coral snakes and cobras, but the taipan is more lethal than either. Pythons form another large family of snakes. The brilliant colour of the young green tree-python changes to an equally striking green as it matures, a harmless snake which grows to two metres in length. Many species of reptiles are now protected because of the demand overseas by zoos and for skins. There are known to be one hundred and sixty species of frogs in Papua New Guinea and of these one hundred and forty are tree frogs. The female white-lipped tree frog is the largest in the world.

The role of crocodilians in the folklore of the people of Papua New Guinea is demonstrated in their art. Shields, drums, boats and buildings bear intricately carved crocodiles. New Guinea can boast of the largest – we seem to compete very well with Texas – in this respect. The estuarine crocodile (*porosus*) commonly known as a salty, grows to over twenty feet (6,10 metres) and is peculiar to the south-west Pacific and Asia. It has the most sought after skin of all crocodilians for the making of leather as it has smaller belly scales. There is also the *noveaguineae* crocodile, a fresh water species. Both species have been hunted in the past and exploited in large numbers by westerners. Unlike the *niloticus* which digs its nest in the sand, these two species build a nest from debris and make a hole in it through which they deposit their eggs. Incubation is between eighty to ninety days.

There are many species of marsupials in Papua New Guinea from the size of small bandicoots to kangaroos. But unlike Australia where kangaroos and their relatives have developed into an open ground species, Papua New Guinea shows almost equal diversity of ground and tree dwelling types such as the agile wallaby, the forest wallaby and five species of tree kangaroo. The Good Fellow's tree kangaroo is strikingly marked in brown and yellow. Wallabies and kangaroos are still hunted for food by the local inhabitants, and one can buy whole 'braaied' wallaby in the open markets right in Port Moresby. Another marsupial, the nocturnal spotted cuscus, is well adapted in its arboreal life-style. It is eaten as well as kept as a pet – probably to be eaten at a later date.

Pigs are not indigenous to Papua New Guinea, but play a very important role and are held in reverence rather like the sacred cow of Asia. Pig-breeding for food and more especially for ceremonial feasts and trade is the most

important occupation. If necessary the piglets are nursed and suckled by the women, an uncommon practice in the highlands.

Deer have also been introduced into Papua New Guinea. The Javan rusa deer was released in a number of localities during the first half of this century. It is a swamp and grassland species from the island of Indonesia, thriving in the vast wetlands south and east of the Fly River in Papua. These deer have increased in numbers to an estimated forty to fifty thousand head, and controlled deer harvesting is planned for the near future. The spotted deer, axis, possibly the most beautiful of the deer family, has also been introduced from Asia into the Madang area of Papua New Guinea.

Papua New Guinea is an orchid-lover's paradise. It harbours the world's largest number of known species – more than two thousand five hundred. One of the most spectacular is the Sepik River blue orchid whose purplish blue spikes attain a length of twenty-four inches (sixty-one centimetres).

Few crops grow in the lowlands; a starchy sago is the staff of life and the inhabitants' main diet in many of the swamps and delta regions of Papua New Guinea. The men usually cut the huge sago palms and float them down rivers to their camps or village. The women chop away at the soft fibrous flesh with an adze; they then pound and beat it into a pulp which is filtered through leaves into pots. The resulting mulch is wrapped in nipa palm leaves before being cooked.

In the highlands there is a grave shortage of arable land and the tribesmen are forced to plant their gardens on precipitous slopes, the staple food varying according to regions: taro, sweet potato, banana and yam.

Papua New Guinea has large tracts of intact natural ecosystems with a very high potential of economic production. Natural resources are the mainstay of the country's economy and are well integrated with the life and culture of the inhabitants. Experience has shown that the most crucial time for the fauna and flora is when patterns of land use are subjected to rapid change – large increases in population, indiscriminate burning of the habitat, increased hunting with modern weapons, deforestation, agricultural development and over grazing. This threatens the natural resources on a scale unprecedented in the history of mankind. The natural resources, therefore, must be properly managed or at least protected from over-exploitation or they will cease to be advantageous to the people who own them. Limit them through carelessness, apathy, curiosity or greed and ultimately we will eliminate ourselves.

Most of the land in Papua New Guinea is owned by the people; in fact about ninety-eight per cent is privately owned, so it is almost impossible to develop large tracts of land into national parks or reserves within the critical period of the immediate future to safeguard existing wildlife populations. Recognizing the problem, special legislation was passed in April 1974 to create privately owned and managed wildlife management areas. It permitted large tracts of wildlife habitat to remain in customary ownership with local inhabitants co-operating with the government to manage the flora and fauna. This legislation has recently been put into practice as demonstrated by the national crocodile project which was launched with the assistance of the

United Nations Development Programme. The main aims of this project are: to provide the villagers in the swamp areas with a viable crocodile industry, and hence revenue, and at the same time to protect the crocodilians from over-exploitation, as they are allowed to harvest only the crocodile with belly skin widths of between 25,40 centimetres and 50,80 centimetres. The export of smaller and larger crocodiles is prohibited. The crocodiles over twenty inches are the valuable breeding stock.

The great scientific and educational value of Papua New Guinea justifies and demands international expert financial and technical assistance in conservation projects. It is the responsibility of Papua New Guinea alone at this early stage of development, but the entire world's responsibility to help protect this magnificent wilderness heritage.

Traditional man's integration with his environment and with his land implies a need for specialised conservation education. The natives are manifestations of traditional culture; they perfectly complement their exotic and picturesque surroundings and are proud of their heritage. The government encourages the perpetuation of their traditions.

Sing-sings are very popular and colourful. Most of the head-dresses for these occasions are created from the birds of paradise plumes. David Attenborough in 1960 estimated that at least two thousand male birds of paradise had been destroyed for dancers' decorations at one sing-sing alone. Even today many paradise plumes and thousands of green beetles are used for head-gear.

The Asoro mudmen perform an eerie silent dance to commemorate a great victory over a neighbouring clan. Many years ago the men of the Mat tribe were driven into the Asoro River. They emerged covered in grey mud and were mistaken for evil spirits by their enemies who fled.

In support of our wonderful wilderness and unique wildlife, the Minister of Environment and Conservation in Papua New Guinea, Mr Steven Tage has said: "The environment and its sacred scenic and historical qualities should be conserved and replaced for the benefits of future generations . . . our ancient belief is that everything has a spirit. While this belief should not frighten us from using the earth for our collective benefit, it should remind us that silly destruction of the environment will lead not only to pollution but to the death of the earth."

Why Cape York Wilderness is Worth Saving

WALLY O'GRADY

My colleagues, Percy Trezise and Dick Roughsey are deeply involved in investigating the influence of the wilderness of Cape York on Aboriginal man, as expressed in his religion and culture, and I hope that we can retain the wilderness in the whole of this area.

Cape York peninsula is at the north-eastern tip of Australia, in the state of Queensland. In discussing Cape York I refer to that area north of a line drawn from Normanton, close to the Gulf of Carpentaria in the west, to Cairns on the eastern seaboard, north to the tip of the peninsula.

This area is generally from 11° to 17° south latitude, being nearly 805 kilometres long, and is the area proposed by the Queensland premier on 15 August 1977 as the region to be set aside as a wilderness.

Covering an area of approximately 129 000 square kilometres, Cape York meets the first requirement of a wilderness in its vastness with the potential for the conservation of a wide range of natural ecosystems, on an immense scale.

It is a wild and largely undeveloped region, with great diversity in its coastal rain-forests, close off-shore Great Barrier reef, large hills of silica sands, heathlands of the "wet desert" area, rain-forest extending down to the beach at Cape Tribulation, the Windsor and other tablelands with their temperate climate, the spectacular red sandstone escarpments of Quinkan with its Aboriginal rock art, much of which has still to be explored, the Iron Range – Weymouth area, biologically the most important in Australia.

Cape York peninsula is a significant natural asset, possessing a wide range of values, with much biological survey work still to be done before the peninsula's fauna and flora are properly described; many areas have not been surveyed at all. From what is known, however, much of the peninsula's biota forms a transitional link between that of Australia and south-east Asia. This is particularly so for the rain-forests which stretch up the east coast, and their associated fauna. Many rain-forest species and associations of flora and fauna are not found elsewhere in Australia, and many have not been described before. So significant is the rain-forest environment, that at least one site, Weymount Holding, is regarded as being of such international significance that its preservation is the highest nature conservation priority in Australia.

The values of Australian rain-forests in general also apply, including extremely high species diversity. At Davies Creek 166 different species of trees and shrubs were found in approximately 0,809 hectares, and elsewhere, at 140 sites, 765 different species of trees and shrubs were found; of these 112 were undescribed. In the Noah Creek area, over 100 species of trees and shrubs were found that are unclassified. All this points to the large amount of

taxonomic work still to be carried out in Cape York peninsula. Among these trees and shrubs there are many of known and potential therapeutic and commercial value, and the highest concentration of primitive flowering plants in the world occurs here.

The peninsula also contains a wide range of completely unmodified wetland environments, many of which fluctuate greatly in size from season to season.

The adjacent occurrence of a vast number of different environments in an almost completely undisturbed state, adds to the value of the species and associations present.

Another important aspect of Cape York peninsula is that it is the terrestrial partner of the Great Barrier Reef for over four hundred miles. The conservation of the reef depends to a large degree on maintaining the terrestrial habitat adjacent to it in its natural state. Known and suspected disruptions to the reef environment south of 16° south latitude, such as the crown of thorns plague, have been attributed to the effect of silt, fertiliser and pesticide residues, caused by agriculture and other habitat modification on the mainland.

It is also highly significant that Australia is the only place in the world where the two highly complex environments of rain forest and extensive coral reefs are found adjoining one another, and Cape York is the only large area where these two adjoining environments are found in their pristine state.

The waters around Cape York are also one of the last remaining places in the world where the dugong, an endangered species of mammal with great potential as a source of protein, is still abundant.

There are two other factors of great importance when considering Cape York; one is quarantine. Cape York is the closest part of Australia to any foreign country, being only about one hundred and sixty-one kilometres south of New Guinea. This, combined with some degree of human and animal traffic between the Torres Strait islands, means that the potential for transfer of diseases from south-east Asia is a matter for grave concern.

That these human and animal diseases, and the fruitfly in New Guinea, have not yet spread southwards must be attributed in no small measure to the wilderness character of Cape York, with its minimal disturbance serving as a buffer.

The other significant fact about Cape York is its position as a buffer against climatic change. The dynamic nature of the world's climate has been well established, and during recent years much concern has been given to the rate, direction, and characteristics of climatic change, with much scientific evidence pointing to the early advent of the next ice age.

The importance of transitional natural regions, such as Cape York peninsula, is therefore greatly magnified as they provide both a reservoir and a medium for the passage of species during climatic shifts. Without such regions the biological stability of adjacent areas and the survival of large numbers of species is placed at risk. Thus the overall biological integrity of the peninsula is potentially a crucial factor in the maintenance of future ecological stability elsewhere.

The only large-scale mining on Cape York is the strip mining of bauxite at Weipa on the west coast, and silica sands at Cape Flattery on the east coast. The major land use is open range cattle grazing, but this has proved most uneconomic, so much so that the cattle industry in Cape York is in a state of virtual collapse, with most properties for sale at greatly reduced prices.

When the Queensland premier announced the Cape York wilderness he said, "This proposal may take several lifetimes to complete."

With the present state of the cattle industry in Cape York, it would be opportune to buy these grazing leases and so have the major part secure in a wilderness in our own lifetime. The graziers who sold would have capital to set themselves up as productive members of a community elsewhere. Those who sold and did not wish to leave could stay on and run a small number of grazing animals and grow fruit and vegetables to service those who come to visit the wilderness. Whatever might apply to wilderness areas elsewhere, the Cape York wilderness would be enhanced by people living there who had a good understanding of nature conservancy. This would apply particularly in the case of fire control.

The Cape York conservation council has always sought to maintain the wilderness character of Cape York, and in 1973 proposed the Quinkan Park to preserve the body of rock art there before the growing tourist traffic could degrade or destroy much of it.

After a lot of frustrating departmental delays and Percy Trezise and myself being subject to an inquiry, we are now in the happy position of seeing this important area being proclaimed by special statute, and myself appointed as one of two trustees for Quinkan. The other trustee is the director of the Aboriginal and Island Advancement Department.

As well as securing this important part of Cape York, Percy Trezise and I have been buying as much wilderness as our limited resources will allow. The Jowalbinna property of twenty-five square miles was purchased in 1975, and the Goorialla property of forty-seven square miles this year. Both these adjoin Quinkan, and together comprise around four hundred and fifty square miles.

The funds to purchase Quinkan were received in donations from all over Australia. This appeal engendered much goodwill when the donors became aware that all appeal expenses were met by ourselves, and every dollar received was used to buy land. We hope to start a similar appeal, and apply the funds to buying land for the Cape York wilderness.

We hope to find the support to extend our activities internationally, in raising funds and co-operating with the Queensland government to establish this wilderness as soon as possible.

Although we have been very successful in our many endeavours in the past – one being the defeat of a proposal to wood-chip the forests within a seventy mile radius of Cairns – our own efforts in such a large project as this must necessarily be limited.

A strong move towards conservancy by world wilderness leaders would stress how badly man has husbanded the resources of his creator.

We are all aware that the human race evolved largely in a wilderness en-

vironment, and although the way of life has changed, basic human biological characteristics have not. The strength of any ecological system lies in its diversity, and the retention of wilderness can be justified for the maintenance of genetic diversity alone, without aesthetic, recreational, or any other consideration.

I cannot stress too strongly the importance of the Cape York wilderness, which includes wilderness environments in their purest, least disturbed forms. Cape York at present exists in almost the same state as before European settlement, with very little disturbance to the whole inter-connected complex of ecosystems. Where else in the world is there the chance to save such a wide range of natural types of country, including the marine environment, on such a scale as on the north-eastern tip of Australia?

Zoos as an Introduction to Wilderness

COLIN GUY CHAMPION RAWLINS

It must be surprising that anyone should be bold enough to suggest a zoo, a human interference with nature if ever there was one, in the same breath as wilderness, the essence of nature untouched by man.

To the people of a country like South Africa, with its vast areas of natural grandeur and beauty unsullied by human habitation, and still full of animals, and indeed to the people of many countries, a zoo may seem unnecessary on the grounds that it cannot do better than the natural world, so readily accessible to them. But how accessible is that world and to how many people? Have all who live in Africa seen a lion or an elephant in the wild in their own countries, or even if they have, what about a mongoose or an elephant shrew, for example? Many of the leading citizens of the new nations of Africa saw their first lion in the great zoos of Europe or America; others saw an Indian elephant in a local travelling circus long before they ever saw an African elephant in their own land, where they may only have known the Africa of Lagos, Kinshasa or Nairobi and not the deserts, the plains and the high mountain forests, the true wilderness of Africa.

But how can a zoo act as an introduction to wilderness and help to develop the concern of people the world over for its preservation? To try to answer this question, we must first of all be sure what we mean by a zoo in this context. A statutory definition exists in the English law. It states: " 'zoological garden' means any place, other than a circus or deer-park, where wild animals not living in their natural surroundings are kept for the purpose of being regularly exhibited to members of the public for gain."

It has been fashionable to treat the word "zoo" pejoratively and to differentiate so-called safari and wildlife parks from the traditional kind of zoo, on the assumption that the use of words like safari and wildlife somehow makes these establishments more reputable. The fact is that the word zoo comes from a popular nineteenth century abbreviation for the Zoological Gardens in London, since when it has become a truly international word used in respect of every public exhibition of wild animals of whatever size or quality. Indeed this appellation is the only thing common to animal collections ranging from scientific establishments like the Zoological Society of London and the National Zoological Gardens in Pretoria to roadside menageries and backyard animal slums.

There are probably something like 1 000 places in the world which can be called zoos and the number of people who visit them each year is probably at least two hundred and fifty million. But more important is the fact that all those zoos of national and international significance, something like one hundred in number, account for at least one hundred million of those visitors, of whom many are people of influence on the decision-making bodies

of the countries concerned. What such zoos do, therefore, is of importance in forming public opinion on many matters concerning the environment and specially, of course, the conservation of wildlife and, by extension, of wild places.

Despite the growth of tourism and the increasing number of people who visit the accessible wild areas of the world such as the great game parks of Africa, most people cannot and never will reach these areas for economic or for other practical reasons, not least in recent times because of political barriers. Nevertheless it is often claimed that such lack of opportunity can be compensated for on television or in the cinema, where animal documentary films, made in great detail and with great skill, give an almost perfect representation of the natural world. But the old adage still prevails: there is no substitute for the real thing and, however excellent the production, however live the pictures, seeing an animal or landscape with one's own eyes is the only real way to full appreciation of it. The sight of a living animal, at reasonably close quarters, is worth any number of TV programmes in applying the final push which turns passive sympathy into active support for the conservation of wildlife and the protection of its habitat. The animals of a good zoo, healthy, active and well displayed against a naturalistic background, can give visitors that little extra sense of the reality of the wild which may make all the difference to their appreciation of it and thus to a wish to see the real wilderness for themselves, or at least to help towards its survival.

Not only in the vast empty areas of Africa, America, Asia and Australia is there wilderness; every part of the world has some. It may simply be a steep hillside above lush cultivated lands, a secluded valley off a densely populated river plain or a thick forest on a mountain-top in Europe. Each bit of wilderness will support its own wildlife; the Scottish highlands just as the foothills of the Himalayas, the flatlands of north-western Europe just as the great plains of Africa. Thus one man's wilderness will be another's wonderland. For even the most sophisticated modern tourist may know the game reserves of Africa but not the jungles of the Amazon; he may have seen the Sahara Desert but not the Gobi. But in his zoo he can see a little of all these different kinds of wilderness and perhaps claim a wider experience of animals than, if I dare say so, those who live close to one, but only one, of the great wilderness areas of the world.

The World Wilderness Congress planners have said that wilderness should "retain its primeval character and influence, without human improvements, or habitation, and with outstanding opportunities for solitude and a primitive unconfined type of recreation." But can such wilderness be experienced by large numbers of people and yet remain wilderness? Human intrusion, however discreet, must conflict with its interests. The dilemma is that wilderness ceases to be so if humans visit it regularly and, if they do not, how is it of value to them? As usual, a compromise must be sought to deal with this dilemma. Man's curiosity and enterprise will never allow him to keep permanently out of wild places, so he has to be allowed in under strict control and, at the same time, given the chance to see some of the beauty and fascination of wilderness under simulated conditions elsewhere.

A zoo's role is to provide these simulated conditions, in which creatures which live in the wilderness are exhibited against naturalistic backgrounds and in accommodation designed to allow them to carry out the whole range of their natural activity. An encapsulated wilderness can thus be presented, perhaps in the middle of a great conurbation and accessible to millions of people who may never be able to see the real thing and who may, indeed, no longer consider it a practical proposition to try to do so because of the availability of the artificial one. A second-best situation, perhaps, but one which indirectly helps to protect wilderness areas from excessive human presence and thus to improve the prospects for their future.

So there are several ways in which zoos can be useful and even essential in helping to further the concept of wilderness:

- (a) They attract visitors and can influence many people in the densely populated parts of the world whose opinion in world affairs is important;
- (b) They show a real living part of wilderness, its animals, making it easier for people to visualize and become concerned about the wilderness itself;
- (c) They show people of one part of the world the animals of another;
- (d) They provide an artificial wilderness "on the doorstep", as it were, of the highly developed areas of the world, thus reducing human pressure on the wilderness areas.

But a zoo which is to be an ally of the cause of wilderness must be properly equipped, both philosophically and physically, to carry out its task. It must have the quality and the status to earn the attention and the respect of its visitors, who must be able to take it seriously. Its purpose must not simply be to make money and it should have a scientific base to its activities. It must be able to teach, to rouse the imagination, to conjure up a world very different from that in which most zoo visitors live.

A zoo's aim should be to represent the wild not just by keeping wild animals but by showing them in such a way that visitors may learn both about the animals and about their natural habitats, and that they may be encouraged to wish to protect the animals in the wild and use their voice, the voice of public opinion, to ensure this protection. Indeed, preaching the gospel of the conservation of wildlife and wild places, by teaching the public about the animals on exhibition and encouraging a concern for their survival in the wild, is one of the basic functions of a modern zoo.

Teaching the public in a zoo is not done primarily by lectures or in classrooms. It is done indirectly through the experience of seeing live animals and from the information provided about the animals. The way they are displayed as well as the visual and aural information giving facts and figures about the animal world complement each other in telling a full biological story explaining not only the physical attributes of the animals but also describing their habitat and their ecology. The experience should be enjoyable as well as intellectually rewarding and the zoo which achieves this end will be fulfilling the desirable role of being "an educational tool in a recreational setting."

The way in which animals are displayed in zoos should follow four main principles:

- (a) Making the physical conditions as satisfactory as possible for the animal or animals with special regard to such aspects as temperature, humidity, surface material and shelter;
- (b) Making the exhibit as aesthetically pleasing as possible to the visiting public;
- (c) Simulating where possible the natural habitat of the animal or animals shown;
- (d) Meeting the requirements of good zoo management, including veterinary care and building and equipment maintenance.

Making the exhibit attractive to the human observer while at the same time trying to simulate the natural habitat of the animal exhibited often presents problems, particularly with outside enclosures for large animals. For example lions in the well-kept parkland of an English country home or a French chateau are no more living in a correct simulated natural environment than those in the smaller enclosures of an urban zoo; indeed, it could be argued that the natural habitat is more correctly represented by asphalt or concrete surfaces, akin to the hard-baked plains of Africa, than by lush English grass.

However, particularly in the main zoo countries of the world in the northern hemisphere, there is such a predilection for garden-type order and tidiness in zoo exhibits that concrete, or even uncut grass and weeds, while more correct for a simulated habitat, may be criticized as unnatural by a public which admires, and believes that animals do so too, the neat lawn, the formal rose garden or clear parkland.

Despite such problems, zoos have come a long way in recent years from the bare cages and enclosures of the past and good simulations of the natural habitat are now becoming normal, even though there are great practical difficulties in achieving good artificial backgrounds and both technical ingenuity and high capital and maintenance costs are involved. Obviously not all zoos have the resources to pay for the costs in buildings, equipment and perhaps, most important of all, in well-trained staff to provide these artificial backgrounds.

If it is primarily through presentation of simulated nature to the inhabitants of the modern urban world that zoos provide their introduction to real wilderness, they also help the cause by the scientific work which they either do themselves with their own resources or which they encourage and support in other research institutions. Although as yet only a few of the leading zoos in the world carry out research in addition to the scientific work involved in the routine management of their animal collections, many of these zoos are known for their fine records in breeding a wide variety of species, including some which are, or may one day be, in danger of extinction. Their achievements in this respect are increasing all the time. There are many problems connected with captive propagation but one effect of zoo breeding successes on the preservation of the wilderness is that less animals must be taken from the wild to maintain zoo stocks and thus more are left to maintain those in the wilderness.

Research by zoos into keeping animals in captivity is an increasingly important contribution to the conservation of wildlife and thus of wilderness

areas. Such work covers an immense field including breeding, disease, nutrition and behaviour – all subjects which together concern the biology of wild animals and the study of them, which is necessary for the ultimate welfare and protection of these animals, not only in captivity but also in their own wild habitats.

While breeding success has become the hallmark of zoo achievement and must thus be the goal of much of the scientific work of zoos, research into the associated problems of disease and nutrition has already brought significant improvement in the health of zoo animals. Healthier animals mean less casualties for which replacements must be sought and, of course, better breeding results. Knowledge gained from research into the control of disease and into natural and artificial diets may have application not only to zoo animals but also to those in wild habitats and may help to save those habitats or to create new ones. In short, every bit of research work done in zoos, every observation, every new piece of information collected, is an addition to the sum of knowledge on captive animals and their care and thus an addition to the knowledge of the species itself. Such work, carried out not only in formal zoo research institutes but by working staff from curator and veterinarian down to keeper, is of immense value to the practical task of the conservation of wildlife.

More than any other medium the zoo can teach a great part of the world's population of the beauty, fascination and variety of living creatures and, by doing so, build up sympathy for the conservation of animals and the protection of their habitats. A zoo can be a wilderness by proxy; it can remind its visitors of the wild places which they have seen or create in those, still the majority of the world's people, who have never known a true wilderness, a yearning for it. In the midst of civilization a zoo can give a glimpse of wilderness, like a quiet sunny glade in the middle of the seething urban forest.

Dartmoor and Its Wild Country

VICE-ADMIRAL SIR RONALD BROCKMAN

There is no part of Britain that has not been grossly influenced by man. Most of the landscape has been changed at some time since the last glaciation by human interference (i.e. within the last 10 000 years), either through deliberate physical acts, or accidental extension of such action. The neolithic agricultural revolution began clearance of the natural climax vegetation – forest, and this “improvement” process persisted as population increases demanded extension and intensification of agricultural land. The politically motivated clearances of forest in the Scottish highlands in the eighteenth century were the last major efforts in this respect.

Soil and climatic variations dictated varying response to such interference, and man’s actions led to a wide extension of the semi-natural vegetation under the general heading of moor and heath. Poor, acid soils, heavy rainfall and continuous grazing combine to produce an open landscape with very low shrubby plants and poor quality grassland. It is somewhat ironic that the least valuable result of the original clearance, in agricultural terms, is now prized so highly by a sophisticated urban society under stress.



'Tor and Gorge' Tavy Cleave.

Britain's wilderness then, is an artificial product, albeit of long standing. Moreover it lacks forest, that significant component of most other wilderness on this planet which modern man can use readily for high-minded purposes. Nevertheless in a small island, with a high population, we are grateful for the geological and climatological good fortune that allows wilderness potential to exist among intensively farmed landscapes. One of our primary concerns in the last quarter of the twentieth century is managing that potential in the face of new and unpredicted pressures.

The major geological division of Britain is between north-east and south-east components. The north-west or highland component thus diminishes towards the south, and the population density and intensive land uses increase in that direction. I must emphasize this combination of trends, because the subject of my address is the southernmost example of our kind of wilderness and because I am in business to manage it in the political sense.

Dartmoor, at the narrow end of upland Britain, is the largest and highest of a series of granite bosses in the south-west peninsula. Even so it is very small in landscape terms – some 517 99 square kilometers of open moorland. A figure-of-eight belt of rocky outcrops – tors – and narrow, steep-sided valleys, surrounds twin plateaus with an altitudinal range of 400-620 meters above sea level. Within these plateaus is the wide, open, treeless landscape of low profile which is the southern British wilderness. Wilderness and openness are, of course, relative terms – and some may be understandably scornful of my use of them in our tiny national park if your comparisons are with veld, savannah, steppe or desert. I must use the moment, however, to underline a major point in our philosophy. The quality of wilderness is in its perception by the individual – and true value is extracted from it by the individual, on his own two feet, unaided by modern technology. His precise, personal experience is confined by the moment in time and the visibility range of his 1,82 meters height. I believe that on a smooth sphere the size of this planet a 1,82 meters tall man might see 5,6 kilometers to the horizon. Except on the highest point of a landscape of hills and valleys his visibility range will be considerably less than that. At the outer limits of his visibility, in any case, interference with the wild sensation will be diminished by focus and difficulty of precise identification. I must claim, therefore, that the Dartmoor high moorland offers a wilderness experience to urban man – and has a rarity value in southern Britain which makes the management of its potential, in the face of the opportunities it provides, a political necessity.

Despite the dominance of wild vegetation, the sense of space and ruggedness, and despite my argument so far, the evidence for man's past and present activities is observable almost everywhere. In a sense, traces of past activities enhance the wilderness experience – for they are evidence of abandonment as well as of activity. Prehistoric dwellings and ceremonial stone rows, circles, cists and standing stones are certainly in this category. Medieval mineral workings, tanners' huts, and little fields and ponds tell of a struggle with the environment that is an acceptable characteristic of wild country. Rare trackways, and stone cross waymarks can be said to be a necessary adjunct of any inhospitable land.

Almost anywhere of course sheep may appear, and in high summer cattle and ponies drift up into the plateaus. They are the obvious symptoms of man's current general economic use of this upland. They are also vital to the maintenance of the character of the Dartmoor wilderness. Grazing and burning, the original producers of moorland from forest 4 000 years ago, remain the only management tools available for its upkeep. There would be no wilderness without them, and they are thus an inevitable component of it. There is, however, considerable debate about their management, species and numbers.

A 231 meter television transmitter mast sited between the two plateaus is visible as a vertical line above many skylines. A 1920s conifer plantation laps over a south-eastern skyline and is then visible from a considerable arc of wild country. Two small reservoirs, their ancillary dams and other structures are within the plateau edges. Most other modern artefacts are seen only from the plateau edge when cultivated landscapes are also in view. The major exceptions to this are the symptoms of military presence, which like animal husbandry demand careful consideration. The Ministry of Defence holds some 12 146 hectares of the northern plateau as ranges for training, involving live firing of artillery, mortars and small arms. The boundaries of these ranges are marked by coloured poles and warning flagstuffs at prominent intervals. From the north an ellipse of metalled road penetrates the plateau southwards for about three kilometers and various trackways radiate from it. The main impact area for artillery and mortar firing shows vast numbers of shell-holes and small craters in the peat of the blanket bog. On firing days the public are not allowed into the ranges in use (there are three and they may not all be in use at once), but there is no firing at week-ends on the plateau, nor at any time between mid-July and mid-September. Just the qualities that we here accept as the criteria of wilderness, equally make for best military training ground. The conflict between military firing and wilderness experience is likely to be smaller than between it and any other human activity. That is not to dismiss the fact that there is a conflict, and a problem for wilderness supporters – and managers, in our context.

Resorting to the Dartmoor wilderness appears to have three different motivations. There are those who are attracted by its own particular character and historic detail – the Dartmoor wilderness specialists. There are those who wish to escape from other people in numbers, stretch themselves, and enjoy the rarity of space. And there are those – and numerically they dominate this trio – who are responding to the challenge which wilderness offers to those whose expectations outgrow their own daily environment. Of course there are those who combine two or more of these, and if asked would certainly respond positively to all three.

The fascination which Dartmoor holds for the first of my motive groups is easily understood – there is, wilderness apart, a challenge to the academic historian and the merely inquisitive. The boundary between these two is very blurred, and local families hand down the fascination from generation to generation. It is intriguing that the bulk of this group is really interested in human artefacts, and will pursue the subject relentlessly, ignoring the natu-



Beardown Man (prehistoric standing stone) Dartmoor.

ral environment, and not recognising any inconsistency in this one-sided approach. In a sense the wilderness is offering them satisfaction at second-hand. It is the effect of a tough, harsh environment on practical, earthy men that has left them with something intriguing to pursue – a wilderness character of the past is more significant than the contemporary state, though that state offers them relatively unfettered freedom to indulge themselves. The scientific interest under this heading is qualified by scale – bog specialists can find bigger and better bogs elsewhere, granite kings, plenty more granite and so on. Again it is the local scientist who pursues Dartmoor for Dartmoor's sake, who needs this particular wilderness. In a sense ease of communication has diminished this value at an adult academic level. But for the 150 000 children and young people of Devon, and the vast number who join them for a week or so academically – there is an outdoor laboratory, studio and classroom here, easily attained, and with slightly more clement weather than most northerly moors.

Eight million visitors arrive in the national park in a year, and the vast majority appear to be content with fairly crowded sites which simply offer a change of scene and immediate opportunity to play, paddle or picnic, while retaining the security of the herd. Some however do deliberately seek the solitude – with effort – which walking in the wilderness offers. It is relatively easy to identify the small car parks from which they set off, and the now scarce public transport opportunities which are available. They like to be alone though strangely this is a shareable quality. Those with the same motive seem to be happy to join together, and the chance meeting of another individual only enhances the experience. The ones and twos among these are the

genuine 'ramblers' – greater groups, bigger than the family, probably really belong to my third category.

They – the responders to the physical challenge – are dominated by the young. They are organized in groups on the ground, either belonging to associations like Scouts, youth clubs, military cadet forces and bodies like the police, services, or educational establishments; or taking part in an organized event and training for it. There are, of course, individuals, pairs and small groups of people, responding to the space, solitude and physical and navigational challenge – but they are a tiny proportion of this category, let alone of the total number of visitors to the wilderness. All of these folk – particularly the young people – are of course a symptom of the growth in the last thirty years of the outdoor pursuits element of the British educational scene. It features as a regular extra-curricula activity of most schools and colleges, is a part of most teacher-training courses dealing in physical education, and needs both incentives and appropriate media. Its rationale depends upon the need to give urban children escape from constraining environments, and its role in character development. Qualities of endurance, self-reliance and team-work can all be developed and enhanced in the face of the challenge provided by wild country.

It is significant that incentives are apparently needed to overcome any initial apathy – awards (Duke of Edinburgh, and others) or competitions are the obvious examples, and the attainment of the event, respectively, are less important than the training for them as users of the true wilderness challenge. This is particularly true of the competitions. The services sponsor and organize the annual challenge called the Ten Tors Expedition. The event itself takes place over twenty-four hours, and now consists very much of a procession of teams proceeding round routes of lengths commensurate with age classes. So many are involved that even navigation is only a problem for the first group – the rest can follow. Inevitably a race develops, innocently fostered by the organizers and the press. Real value, in all the senses so far enumerated, is obtained, if at all, from the training sessions, when participating teams are really on their own, at times, and on routes of their own choosing. Indeed the fact that they practise in the winter for an event in May, says much for the more effective challenge of the training itself. It is unfortunately true that the training would probably not be indulged, unless the now mundane event was itself maintained. The faults in the system, in some senses, flow from the smallness of the area of our wilderness.

Some 400 000 people in total thus use the Dartmoor wilderness annually. Most implicitly demand organization, bases from which to operate in some cases, rescue services, and of course all need the wilderness protected as the medium for their activity. Such media are rare in southern Britain.

The National Park Authority stands alone as the potential protector for these purposes. Under British legislation it has minimal power, and achieves what it can largely by persuasion. It can control new intrusions, provided society, through Government, backs its position. It can only persuade owners, occupiers, commoners and other land managers to maintain vegetation communities at their present level of distribution.

It must, therefore, persuade itself that what it tries to do is really needed – for that need is not always apparently recognized by society in any overt way. It is sometimes difficult to believe that the trampling group of adolescents actually notice the red grouse or the golden plover, far less than the lizard or the pale butterwort. It is even more depressing to discover that the fanatical defender of wild country has never rationalized his or her attitude to it. Defence against the motor car, structural intrusion, or military activity is one thing – but who will face the regulation of the numbers of booted, self-contained, wilderness challengers in the interests of solitude, peace and silence for. . . well, for whom?

In a democracy, how many coloured anoraks can you afford to see, before the wilderness ceases to be your wilderness?

Conservation, Parks and Wilderness: Aspects of the Jamaican Scene

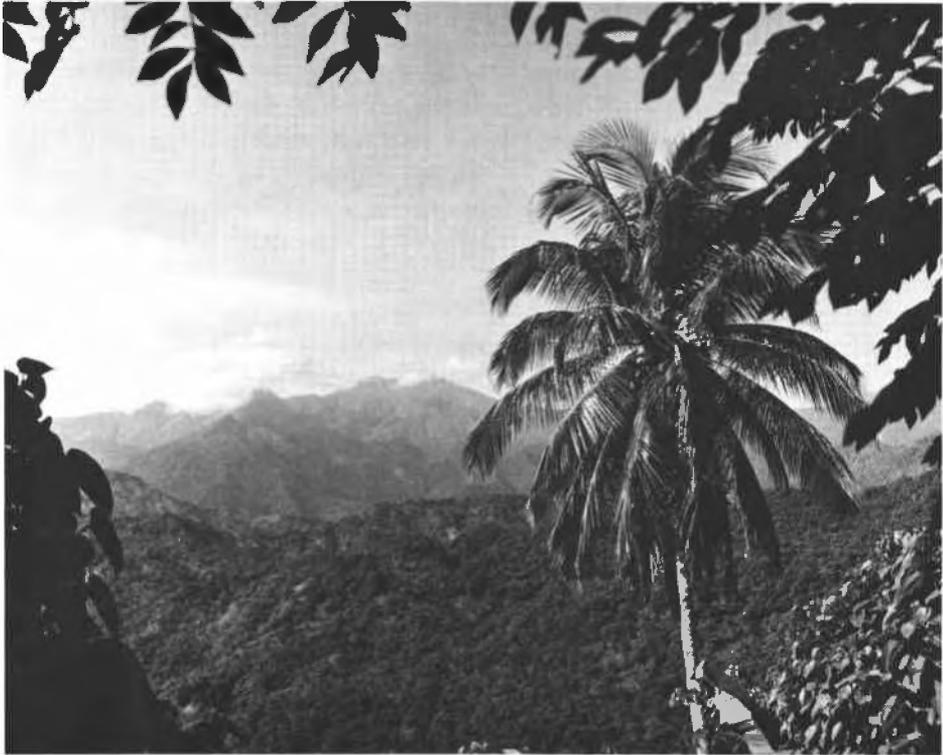
BRUCE STRATTON YOUNG

I hope to convey to you something of the nature, the context, and the plans and potential for wildlife conservation, parks, and especially wilderness areas, in the Caribbean island of Jamaica.

I am not a Jamaican – native, citizen or resident – nor do I have any official status. But I have made several research visits as a professional geographer to the island since 1963, including two in 1977.

Jamaica is a mere 11 395 9 square kilometers in area (I believe that alone might exclude it from having a recognized national park, on the I.U.C.N. size criterion). It has a population of about 2,1 million; so the overall density is nearly 1 295 square kilometers. Over fifty-nine per cent is rural – a million folk – pretty well distributed about the island. Certainly, there is a strong concentration (over 600 000) in the Kingston metropolitan area, and in the rural regions there are two or three emptier areas, notably up in the steep-sided, eastern Blue mountains and in the John Crow mountains (in parts of Portland and St. Thomas parishes), and another in the famous Cockpit country, in the north-east (Trelawny parish, partly) – limestone, karstic, underground rivers, caves, a real jumble of conical hillocks and ridges divided by deep precipitous glades, which are the “cockpits”. The total population is growing at about 1,7 per cent per annum (it would be 2,3 per cent, if there were no emigration), and the land area is, of course, fixed. Income and welfare levels are low, and the Jamaican farmer, technologically, is a machete, hoe and fork man, working a micro-farm of 0,81 to 2,03 hectares – probably a mixture of sugar, bananas, coconuts, yams, pimento, maize, ginger, coffee, cassava. The larger estates are sugar and bananas. Twenty-four per cent of Jamaica is forested; fortunately half of that is state land, and the Forestry Department which cares for some of the recreational areas, in the wetter mountains (7 620 mm plus) and cockpit country (2 032 mm), is very active in caring for the remnants of indigenous forest (mahogany, mahoe, bulletwood, fig, podocarpus and others).

Two more points for our perspective, firstly bauxite. Probably 500 million tons of bauxite lie just beneath the top (154 4 mm) of the soil, scattered on parts of the eastern white limestone; and Jamaica's main natural mineral wealth is there – for as long as it lasts. Mining it involves, of course, disturbing the flora and the very sub-soil. Then there are tourists: Jamaica is “the island of the sun”; it has one or two long magnificent beaches (Negril in the west), many splendid smaller ones; and the lovely Caribbean waters, protected by coral reefs. In 1973 more than half a million visitors went to Jamaica, a jump from 300 000 in 1967. Regrettably, this sector of the economy



The Blue Mountains: Jamaica's famous Blue Mountains are one of the outstanding features of this lovely tropical island, for they are the highest in the Caribbean, rising to 7 402 feet. They get their name from the smoky blue haze that hangs around their peaks which are often shrouded in the clouds. Jamaica's highest mountains ensure a steady amount of rainfall during the year, which keeps the island lush and green. On the mountain slopes grows the finest coffee in the world.

Jamaica Tourist Board Photo

has been suffering grievously in the last three years – the 1977 figure was down to 471 000; and the general story is of falling hotel occupancy rates, and hotels (like the Tower Isle) closing for the summer for the first time in twenty-five years. But that may be temporary – there are political and security scares; but they are problems which can be overcome.

These preliminaries lead to three main points:

(a) In Jamaica, parks and recreation and wilderness are (or have been) something of a luxury. People have to be fed, money has to be found, resources have to be exploited and exported, leisure-time is not abundant, and life is not comfortable for the mass of people. Certainly, pure wilderness, where man cannot be, except as an observer, is a luxury.

(b) In spite of this, the politician, it seems, has not lost sight of man's need to re-create, the need for parks, for conservation, and even for wilderness trails; and, in my judgement, the tourist market, the needs (whether perceived, or yet to be learned) of the Jamaicans themselves, and the effort of Jamaicans who can look a generation or two ahead (because, mainly, they are

overseas-trained, and are even now in training overseas – we have some Jamaicans working with the Canadian Parks Service). These factors have contributed to plans and policies which, if implemented, bode well for Jamaica.

(c) There is the question of whether environmental degradation is a necessary concomitant of economic progress, and academic geographers have, I'm happy to say, played a role in this questioning. A little pamphlet of a symposium on conservation in Jamaica, edited by geographer Brian Hudson has been published.

Three significant governmental, institutional aspects require mentioning:

The Jamaica government has recently set up a natural resources conservation authority, for a variety of reasons – all contributing to the degradation of the environment (by alumina companies, industry, sewage and industrial waste disposal methods, by land reclamation upsetting ecological balances along the coast, by oil spills, beach erosion, illegal hunting of the crocodile, dynamiting of fish, the filling-in of natural swamps (wetlands), the spoiling of breeding grounds and feeding areas for birds and wildlife, and not least of all, by man seeking to farm on steeper and steeper marginal land).

The authority has branches in ecology, national parks, wildlife, wetlands and other fields. It seems a sound structure and work is being done. But trained personnel are few, and the budget is small; and in the priorities of the island some aspects must rank low.

Regional planning is a new activity, and in 1969 I could publish a paper impudently pointing out the lack of any evidence of it in the first independence plan (1963-1968). Now we have government departments working on plans for six regions.

With the assistance of a United Nations team, a very bold national physical plan for 1970-1990 has been formulated. The 116-page plan, and the accompanying atlas are fine documents.

The forestry department is very active in Jamaica. The motto for the areas they control is "Take nothing but photographs: leave nothing but footprints." An F.A.O. official, Bullard, produced a report in 1972.

What of the attitudes and the perceptions of Jamaicans to conservation, to parks and to the wilderness concept? My information is not scientifically founded. My sample of interviewees comprised friends, casual acquaintances, officials. However, I would venture to say: (i) Very few Jamaicans seem excited about going off into the wilderness to rough it. The urbanites seek the beaches; the more affluent, the attractions of Miami; some rural folk seek the bright lights of the city. There are younger people who are keen hikers and trailers. Age and education are important variables; (ii) most foreign tourists go for beach, the sun and the water – but government, especially the present Manley government, is eager to show them, close up, the mountains and the Cockpit country, and generally the "real" Jamaica. The segregation of tourist and native is an irritant in Third World countries; (iii) most people quite rightly perceive the mountains and the Cockpit country and other areas as pretty inaccessible and difficult or costly to reach. And if

they are not difficult to get to – either because the road is washed away, or there have been landslides following heavy rains, or there are no roads at all – you might quickly destroy the natural, wilderness, quality of these areas! That is a familiar situation with natural areas you wish to conserve. I do not know the answer to the carrying-capacity problem; (iv) we may expect, I think – as living standards rise, as the idea of man returning, however briefly, to look at nature, is accepted, as industrial activities increase, as infrastructure improves, and as the beaches become overcrowded – greater pressures on parks, on conservation areas and on wilderness areas, a greater need to control its use and to protect nature from man.

My judgement is that there is some awareness of the future pattern of demand and I hope government will not be neglectful of tomorrow in its very proper concern to improve the quality of life of the Jamaican people today.

Art of the Wilderness

PERCY TREZISE

Cape York peninsula has several areas which contain minor examples of Aboriginal rock art, but the main body of prehistoric and historic art occurs in the south-east section, located in shelters among sandstone plateaus, which occupy an area of about 25 900 square kilometers.

The sandstone country is very rugged and harshly beautiful, dissected by deep gorges and creeks and topped by grey and red scarps of the plateaus. It is heavily timbered with an open forest of eucalyptuses and acacias. At present all the area is used for open-range grazing.

Cattle mustering and mineral prospecting take place mainly along the creeks and rivers, but as there were virtually no valuable minerals in the sandstone the rugged country remained unexplored and the existence of the vast and spectacular body of art unknown. The Aboriginal tribes of the area had disappeared before the waves of European and Chinese prospectors began travelling through it to the Palmer River goldrush in 1873 and 74.

Magnificent Gallery, Cape York Peninsula. Discovered by P. Trezise in November 1977. A white hills kangaroo superimposed over many other figures.





Recording ancient figures by $\frac{1}{8}$ scale drawings.

In 1960 road builders announced the discovery of several large and colourful galleries in rock shelters near Laura. I inspected the new find that year and was convinced that the array of varied and colourful figures in a mosaic of superimposed layers must be only a small part of a large body of art throughout the sandstone region.

Since then I and colleagues have employed aircraft for preliminary selection of likely areas, followed by intensive exploration using landrovers, pack and saddle horses, and on foot. After seventeen years of effort we have discovered several hundred galleries containing between them many thousands of figures. We estimate that we have discovered about sixty per cent of what exists. So far this year we have found eighteen new sites containing over 400 figures, some of them very spectacular. It is one of the largest bodies of prehistoric art in the world.

During the early years of our exploration we were able to gather much information about the engravings and paintings, the meaning, purpose and significance behind their creation, from the remnants of old tribal people who had formerly inhabited the region. Much of the mythology concerning the land and its creatures, natural and supernatural, was also recorded.

The rock shelters occur in the weathered bases of the scarps and under huge slabs of sandstone detached from the layers of decaying sandstone. Often they are ideally located close to permanent water and could be used during the dry season – December to March – when sufficient water could be caught under the drip line, and to hunt and forage in the high country. Dur-



View of extensive Magnificent Gallery.

ing the dry cool winter months the families camped around waterholes or by drying swamps and lagoons.

The motifs engraved or painted depict men and women, all the animals, birds, reptiles and plant life of the wilderness, as well as putative ancestral beings, supernatural spirits, both friendly and harmful, and all the things of their daily life, their weapons, implements and utensils.

The art has many different motivations including ancestral worship, totemic maintenance ritual, love magic, hunting magic, sorcery, mortuary rites, fear of supernatural spirits, and ownership marks. There appears to be no "art for art's sake" as everything portrayed has a specific purpose.

The major portion of the body of art depicts the more spectacular aspects of life such as hunting magic, sorcery, love magic, and these figures were executed on the back walls and ceilings of living shelters. Art depicting the secret and sacred ceremonies of the men was usually placed in sites unsuited for habitation, out of bounds to women and the uninitiated.

The first art-style in the chronological sequence of styles was that of an early engraver, who appears to have been much concerned with emus. This early art has been dated by C40 methods to a minimum age of 13 200 years B.P. However, geological evidence suggests that it may be twice that age. The ancient style of engraving was succeeded by other styles of petroglyphs, until engraving was abandoned for the easier and more spectacular pictographs employing ochre paints which are plentiful in the area.

The superimposed layers of engravings and paintings are in fact the re-

corded history of the people living in the sites over many millenia. The layers can be unravelled to reveal a constant change in importance of motifs and motivations, reflecting population increases or decreases, changes in weather patterns, food supplies and other matters. There is evidence from remote times of affluent societies having leisure to execute large works of art for totemic and ancestral worship, while living well on succulent emus, and later mute evidence of scarcity of meat and men reduced to living on nonda fruit which was once the food of the emu.

The paintings portray the entire gamut of human emotions, of loves and hates, of fears and hopes, of joy and sorrow. The art was an ever present part of daily life, a constant reminder of tribal laws and sanctions. The Quinkins, an Aboriginal name for supernatural spirits, painted on the ceiling of a cave and seemingly animated by flickering firelight served to remind children of the presence of these dangerous creatures in the bush everywhere about them. Because of the Aborigines' animistic beliefs and their concept of genesis – that every living thing was once a man – everything about them was treated with due deference.

It is a never failing pleasure to be exploring the wilderness and come once again on a new site. One is totally absorbed by the mystery of its remote past, of sensing all the past pleasures, tragedies and other events that had occurred there, the rightness of the ochre figures in the natural setting – and the awareness that countless generations of people lived in that setting without causing any significant changes. It is still a wilderness bearing only ochre paintings and charcoal to mark the passing of many millenia and countless generations of people.

It was perhaps two of the major Aboriginal laws which made this wilderness conservation possible. They are:

The land is all that you and your children's children will ever have: take care of the land and it will take care of you. Take what you need from the land, but need what you take.

Wilderness in Central America: Present Achievements and Likely Prospects

GERARDO BUDOWSKI, Ph.D.

Central America, wholly situated in the northern tropics, covers an area of 520 744 sq. kilometres (including lakes and lagoons) with a population of over twenty million in 1977. Included are the following countries with their area and approximate population in 1977:

COUNTRY	POPULATION	AREA (km ²)
PANAMA	1 800 000	77 082
COSTA RICA	2 100 000	50 900
NICARAGUA	2 400 000	127 664
HONDURAS	3 200 000	112 088
EL SALVADOR	4 300 000	21 156
GUATEMALA	6 400 000	108 889
BELICE	150 000	22 965
Total	20 350 000	520 744

Panama is often excluded from Central America for historic reasons but is a member of several regional organizations labelled "of Central America and Panama". Belice is very seldom included as part of Central America although undoubtedly a geographic part.

The population is very unequally spread, with the highest densities at middle elevations, usually in regions where there are good soils derived from fresh volcanic material.

Within this rather small area there exists one of the earth's greatest areas of diversity in terms of climate, soils, geology, and plants and animals from the north and the south¹ (Budowski, 1965). For instance in one locality over only 600 hectares within the lowland rain forest of Costa Rica, an ornithologist recorded 331 different species of birds over a period of one year.² Nicaragua is the southernmost natural boundary of native pines and other species that migrated from the north. Panama has a very large number of elements of the flora and fauna of the South American continent. Moreover many species of plants and animals are endemic and new descriptions of species appear commonly in scientific journals.

Today it is generally assumed by plant ecologists that almost all of the whole area was originally covered by different kinds of forests varying according to rainfall (thorn forest, dry forest, deciduous forest and the different gradations of rain forest) with savannahs practically absent except on swampy areas and naturally disturbed lands. The relatively recent arrival of Amerindians – variously estimated at between 30 000 and 60 000 years ago or

more – changed this picture over relatively small areas and almost only in the last 2 000 years. The largest disturbances are very recent.

The ecological zones affected by Indians were those with a seasonal rainfall and mostly on gentle topography, both in the lowlands and the highlands. This left until recently close to seventy per cent of the land area undisturbed, mostly in regions where rainfall is over 2 000 mm, often close to 3 000 mm a year or more, with scarcely a dry season. Here fire could not be used to remove vegetation and this, more than anything else, explains the persistence of different types of rain forests.

These forests, together with the mountainous steep or inaccessible areas where there are over fifty major volcanoes, some still active today, constitute the greatest extensions of present wilderness areas. The picture is totally different for the deciduous forest, liable to fires and which have all but disappeared. Fortunately one area is today protected, the Santa Rosa National Park in Costa Rica.³ The introduction of cattle by Spanish colonization infringed mostly on these deciduous forests. It is only in this century and perhaps above all in the last twenty years, when large machines could be successfully used, that a gigantic onslaught against the wet areas covered with forests, has been witnessed. These wet areas in the lowlands and on steep wind-exposed slopes, are still the largest remnants of wilderness areas.

Here many types of wilderness areas are still relatively well represented and offer a very promising field for setting up adequate reserves, such as national parks to foster social, cultural and economic benefits⁴ as well as a future heritage for the people of Central America and the rest of the world. But efforts towards achieving these goals face tremendous difficulties.

The following account attempts to describe the failures and successes of the last few years and to explore what is likely to be in store for the future. Since seven countries are involved the appraisal will necessarily include generalizations, and allowance should be made for exceptions. However, it is felt that the described situation is fairly characteristic of many regions in tropical America, particularly in wetter areas. To understand the present and future status of wilderness, it is important to grasp above all the dynamic relation between population and resources.

Until rather recently wilderness was rather a bad word, or at least something which had to be done away with. It was accepted almost *a priori* that wilderness was to be "conquered" through human intervention such as settlements, and the extensive forests were better replaced by grass for cattle or crops. Even today archaic "territorial" tax laws still penalize land owners who have left their primary forest intact while they favour those who have removed it, even if the use made of the cleared area is only ephemeral and some kind of secondary brush or forest later becomes established.

A "positive" appreciation of wilderness is a very recent phenomenon, triggered by the following combination of phenomena:

- (a) The fast disappearance of wilderness has alarmed many people who believe that it fulfils a useful function of conservation mostly related to water quantity or quality. For many there is a strong – although unsubstantiated – belief that rainfall is favoured by the presence of forests.

- (b) Wilderness offers four resources: controlled tourism, scientific research, education, even national pride. For instance in the last two years the highest mountain peaks and their surroundings of both Costa Rica and Panama have been officially declared national parks, although not managed as such yet. Volcan Poas and its surroundings is a national park in Costa Rica where all these resources may be used.⁵
- (c) Failures in attempts to colonize wilderness areas, mostly rain forests, by replacing them with pastures or crops, on soils that could not sustain production, have been eye-opening and there has been some search for management alternatives that do not involve destructive practices.
- (d) A world movement on the value of wilderness has made an impact on the countries of Central America. This has been witnessed particularly in the last five to ten years. In some cases it has enabled some government officials, scientists and organized local movements – often buttressed by foreign conservation organizations – to advance the cause of wilderness as a valid alternative for development. This cause has been espoused by some influential political leaders.

In spite of these developments, wilderness still means different things to different people, but sadly only a few of all of these meanings are advancing the cause of preservation of wilderness.

Wilderness today is usually restricted to areas which have remained untouched, mostly inaccessible or very humid regions usually with sparse

National Parks, particularly in Costa Rica have been enjoying financial support from a number of international organizations, particularly IUCN and WWF. This is acknowledged by signs along the roads.



populations, or none at all. But when native populations are present, they are usually of great interest since they are well adapted to the wilderness habitat.

Wilderness areas are quickly dwindling, because of opening up through roads, timber exploitation, spontaneous or Government-directed colonization schemes, themselves often triggered by dramatic population increases. Figures on the rate of depletion are rarely available. For Costa Rica it is estimated conservatively that the area of forest cleared for pasture is around 50 000 hectares a year, which is one per cent of the total territory and about two and a half per cent of the present total forest land, of which a substantial amount is still in wilderness.

For wild animals – almost all of them largely arboreal or aquatic – this implies irreversible loss of habitat. The depletion is aggravated by the demand from abroad for live animals for pets or medicinal research or for their products, mostly skins. Hunting by local inhabitants is widely practised and poorly controlled and the same can generally be said for fishing, including the use of explosives or poisons.

Action is being taken against these trends, much of which has been successful only in relatively recent years and due credit should be given to the many pioneers who have made noteworthy contributions over the last hundred years and one could enumerate a long list of distinguished advocates of wilderness over the last fifty years; most of them, however, were alien to the region but nevertheless eloquently expressed their dismay at the gradual destruction of forests.

But their pleas were not heard although they are honoured today. The real awakening usually associated with the advent of local leaders in positions where they could actually do something about it, and in fact did is a recent phenomenon. It began about ten years ago in Costa Rica and is now happening in varying degrees in all Central American countries. It is interesting to analyse the factors that brought about the positive changes leading to action.

As many promoters of wilderness well know, it is not knowledge of areas, not even management, which is lacking but the adoption of effective measures by leaders who are in position to take action or decisively influence other decision-makers.

In Costa Rica, one name comes immediately to mind: Mrs. Karen Olsen, wife of the former President and political leader José Figueres known as Don Pepe.

Against considerable political and administrative resistance she was able to provide funds for the budding National Park Service and give conservation the respectability it had been lacking. Her pioneering efforts have not been in vain. The President of Costa Rica, Daniel Oduber, is a staunch conservationist who has more than quadrupled the area of national parks and protected areas of his country in the last three years.

The status of conservation is also improving in other countries. In Panama, where the interesting rain forests and mountains in the canal zone are inevitably becoming a subject of real estate speculation in view of the Torrijos-Carter treaty to be ratified – because of the immediate vicinity of the larg-

est cities and population concentrations – the avowed Government policy is to have many of these areas protected. Other encouraging developments in Panama include the publication of management plans for the Altos de Campana and the Portobelo National Parks.^{6 7}

In Honduras, the Government has successfully been able to set up an inter-institutional group to co-ordinate action programmes for the large Lake Yojoa area, where conservation, tourism, watershed protection and farming interests are closely interrelated.⁸

In Nicaragua a most prestigious bank has lent financial support towards the creation of the first national park at Volcan Masaya. The management plan for Volcan Masaya and vicinity has already been published.⁹

In El Salvador, a highly respected industrialist is taking steps to eventually transform his extensive privately-owned unique cloud forest into a protected reserve. Among other attractions the famous quetzal birds are found there.

In Guatemala, Volcan Pacaya has been the object of a careful study towards its conditioning as a national park.¹⁰

These few examples do not do justice to the many other efforts in the area. But they are precious success stories which may serve as inspiring examples.

The "elfin forest" found on the top of Volcán Poas National Park, Costa Rica's pilot park with an annual visitor number of close to 100 000 people. With one of the largest crater lakes, various nature trails, a visitor centre and a well organized administration, it is Central America's best known and best run national park.



Although a series of international organizations has been involved in supporting local conservation programmes in various countries before 1974, notably the preservation of the endemic Atitlan grebe and the green turtle on Costa Rica's Atlantic coast, a turning point was undoubtedly the IUCN regional inter-governmental conference held in December 1974 in San José, Costa Rica, representing four of the crucial sectors involved in wilderness preservation, notably national parks and wildlife, tourism, cultural heritage and the central planning office, for each of the six countries (IUCN, 1976).¹¹ This meeting was a joint effort between IUCN and other international organizations, notably WWF, FAO, UNESCO, UNEP, Rockefeller Brothers Fund, and the Organisation of American States. As a result of this and subsequent consultative meetings, a fully fledged international action programme based in CATIE, Turrialba, Costa Rica has been operating since July 1976, supported largely by Rockefeller Brothers Fund but with UNEP, IUCN and WWF and others actively co-operating. This programme is deeply involved in the management of wilderness areas as a valid alternative to development and is fully engaged in supporting local organizations in such programmes as:

The creation of a large park along the Panama-Colombian border, covering 300 000 hectares, helped in large part by other groups intent on preventing the spread of the foot and mouth disease from South America. It will include extensive wilderness areas, mostly tropical wet forests.

The establishment of the large Chirripo National Park in Costa Rica, a series of formerly glaciated peaks reaching over 3 800 m, where some of the largest oak forests of the world are found.

The spectacular Volcan Masaya National Park and surroundings in Nicaragua¹², covering an area of 7 000 hectares.

A very large high rainfall area in the Mosquitia region in Honduras where among others, large mammals such as jaguars and tapirs will be preserved. The area involved is 180 000 hectares.

The Nancuchiname forest, the last remnant of a dry forest in El Salvador with 1 000 hectares, as well as the unique Montecristo cloud forest covering another 1 000 hectares.

A study of attitudes of rural inhabitants towards wildlands.

A survey on the status of the Central American Fauna (a project also supported by the Fauna Preservation Society).

A comprehensive education programme at different levels, including mobile seminars in various countries, the publications of teaching aids and a periodic newsletter.

These programmes are certainly not the only ones but they have the merit of being regionally co-ordinated for all six countries and each involves local governmental organizations. Partly as a result of international co-operation decisive action was taken to set apart Corcovado National Park in Costa Rica, covering 30 000 hectares of some of the finest tropical rain forest areas.¹³ U.S. based conservation organizations contributed their moral and financial support and justly recognized the role of President Oduber of Costa Rica as a conservation leader of world-wide significance.

It is almost entirely to the credit of a local organization in western Panama to have Volcan Barú National Park established following an earlier proposal as a national park in 1977.¹⁴ In Costa Rica, Honduras, El Salvador and

Guatemala, local groups can be credited with influencing public opinion, in prodding Government action or, what is more important, in sometimes avoiding costly mistakes being made in the name of development.

There have also been drawbacks: a too-heavy dose of emotionalism, a lack of pragmatism when it comes to the fate of the poor farmers, have produced backlashes and lack of credibility for some of these same conservation organizations.¹⁵

There is no doubt that some of the staggering problems faced by other tropical developing countries also prevail in Central America: the dangerous population resource relationship, faulty or conflicting land use schemes, the pursuit of short term economic benefits at the expense of wilderness areas, the lack of trained wildland managers, and of course the continuing lack of appreciation of wilderness by most of the population.^{16 17 18} Except for the last two factors, all the other problems have become magnified in the past few years. Most destructive of all is possibly the very recent onslaught on the rain forests of Central America, mostly to open new grazing lands to produce beef for export to meat-hungry countries, perhaps above all the hamburger industry of industrialized countries where Central American lean meat is very much in demand.¹⁹

Nevertheless there are good prospects of setting apart a few well protected parks where zoning will allow for wilderness to be perpetuated. But let us have no illusion as to the fate of the present wilderness areas. As much as eighty to ninety per cent of what is left today will probably go in the next twenty years. All our future efforts should concentrate on making the most of the opportunities available.

In saving this precious ten to twenty per cent, the Central American countries need the support of the international conservation community. Experience has shown that success can be achieved by using a combination of efforts, where contributions to worthwhile projects are combined with the support of those political leaders willing to implement policies leading to action. Above all the fitting in of wilderness into land-use planning and development schemes will be crucial.^{20 21} Any effort to relieve the pressure on actual and potential wilderness areas will be most rewarding. The same can be said for the adoption of ecological principles as a basis for development.²²

Let us look at a few odd and little known situations that are relevant to wilderness. Fast-growing trees established on eroded land can possibly do more to relieve the pressure on primary forests than laws or restricting devices.²³ There appears to be some future in tax incentives for reforestation as promulgated in Costa Rica and Guatemala, particularly if this is done on degraded land – never at the expense of the primary forest. Conservationists, if they are to make an impact, must learn to join forces with other professionals instead of fighting them. There are foresters, agronomists, cattlemen, fishermen, and so many other professions willing to listen and support sensible conservation projects when it can be shown how much this could indeed favour their own respective industries.

At present the future of Central American wilderness still looks bleak. Although a few sparks are kindled here and there, the trend is definitely

negative when the whole region and its fast dwindling wilderness areas are evaluated.

A combination of pragmatic approaches towards action programmes, the exploitation of catastrophes as well as successes, building up of local leadership, massive education programmes and careful channelling of funds have all been shown to lead to action programmes. It is unrealistic to expect the Central Americans to achieve these objectives by their efforts alone. International co-operation will be necessary for some time but it must be provided efficiently and without hurting national dignity. It is a challenge which involves the whole world. Success depends on local action, where leaders will find it rewarding to integrate wilderness as a valid means of improving the quality of life. In Central America at least, it is acceptable to call the preservation of wilderness a legitimate means for development – of the right kind.

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The Economic and Cultural Values of South African National Parks

DR ROCCO KNOBEL

The national parks movement on a global scale has as its basic purpose the benefit of mankind, individually and collectively. In 1864, the Congress of the United States of America set aside some public lands and granted to the state of California the Yosemite valley which eventually brought into being the first ever national park at Yellowstone in 1872.

Gradually the national parks concept evolved – a process in which South Africa was also an active participant – resulting in a network of some 1 250 national parks and equivalent reserves all over the world.

It is obvious that a movement which has attained such magnitude could not have developed without the necessary funding. This implies the availability of capital for investment and signifies an action to which certain cultural achievements are attached. Economic and cultural values of national parks are consequently problems and concepts that are gaining momentum in importance and recognition.

It must also be emphasized that national parks are widely accepted as a specific form of land-use. Furthermore, it is clear that the natural resources which they contain have in fact become part of national resources. Consequently the idea of national parks has become an integral part of the South African way of life – and of that in other countries – and the contemporary South African scene and society are gradually beginning to reap the joys and benefits of deliberate and planned action which is fundamental to any well organized system of national parks. Like the rest of the continent of Africa, the Republic of South Africa is well endowed with notable botanical and zoological displays of indigenous wildlife. These features are usually found in our national parks, which are drawing increasing numbers of tourists from all over the world, providing important foreign exchange.

With the increasing world population, and concomitant threats as a result, it is inevitable that there will be an accelerated pressure on land at present used as national parks (in contrast to being available to organized agriculture), and if these areas are to remain unscathed and intact for generations to come it is imperative that they should play an increasingly significant role in the economy of every country.

It is well known that tourism has become a major industry today and this development has affected the South African national parks, as it has national parks throughout the world. The turnover accrues from money paid for admission to the various parks, accommodation within the parks, the sale of souvenirs, the sale of provisions during the sojourn within the park, fuel, accessories, and various items required for day to day living. These trans-

actions can be expressed in an ordinary profit and loss account. The figures for the Kruger National Park alone for the financial year ended March 1976 show that virtually 375 000 people – the highest number yet – visited the park during 1975/76. Vehicles allowed entrance amounted to 95 322. Despite a number of unfavourable factors such as inflation and the enormous increase in the price of petrol, this figure equals an increase of 3,18 on the previous year (1974/75).

This resulted in a gross income from tourists for accommodation and entrance fees of some R2,7 million and a trade turnover of approximately R4,8 million.

However, when assessing the economic value of a national park as a tourist attraction, it should also be borne in mind that visitors to national parks, especially in Africa, crave to return to nature and in most cases do not expect luxurious accommodation. Keeping this in mind, it is safe to state that in order to accommodate a visitor in a national park in such a way that he will return there and that he will recommend the experience to his friends requires only about one third of the capital outlay required for housing and accommodating tourists in other sections of the tourist industry. Therefore, money spent on the provision of simple, yet comfortable accommodation in a national park is unquestionably a sound financial investment.

Experience has also shown that national parks and similar sanctuaries provide a ready market for handicrafts produced locally. Visitors to these parks are usually keen on acquiring something indigenous and typical of that part of the country in which the park is situated. The sale of crafts and products as souvenirs is a far greater stimulus to the economy of a country than is generally known or acknowledged.

National parks are dynamic, ecological entities and no national park can be controlled without a sound management plan. It is essential to base management plans on sound, unbiased scientific research, and this commonly leads to the need for harvesting a certain amount of the main species protected in such an area. The culling programme could in many cases become an important source of income. In the Kruger National Park income for the by-products depot from elephants, buffalo and impala, amounted to R636 000 of which R412 000 represents expenditure, leaving a nett surplus income above expenditure of R135 000 (after allowing for depreciation of R90 000).

Tangible profits like this can be expected from a well developed and properly managed park system. However, there are also indirect aspects to be considered when the economy of national parks is evaluated, for example, money spent by visitors before their arrival or after a sojourn in a park. This entails expenditure associated with preparation required before embarking on the trip, such as financial outlay in their home towns and in their own community or on the way to a particular park. For instance, readjustments or repairs in order to make a car roadworthy for a long trip could possibly entail a set of new tyres, the expenses of fuel when in transit, the acquisition of suitable clothing, food, refreshments and hotel accommodation. It is clear that the whole economy benefits.

Those with interests in commerce, wholesale organizations or retail shops, garages and the transport sector, hotels and the allied facilities required for tourism which happen to be on the way to such sanctuaries consider this type of tourist trade one of their main sources of income. Furthermore, it is also a well established fact that whenever land for a new park or sanctuary is acquired, the land in proximity to or around it immediately skyrockets in value. It is obvious that these are good examples of the intangible economic values of national parks.

It can also be stated without fear of contradiction that national parks often attract well-to-do financiers and influential personalities as visitors, from abroad and locally. A visit to these sanctuaries often influences such visitors positively towards the potential scope of the country and the potential security of envisaged investments. These actions naturally increase goodwill and understanding.

Publication of books on wildlife has become a lucrative and an economic proposition, and the production of wildlife films has become fashionable and profitable. They indirectly draw record crowds, and increase the intangible economic values associated with national parks.

Whenever the concept of land-use as applied by the national parks system is assessed, the economist usually has difficulty in bringing the valuation of a national park within his traditional frame of reference. He stumbles over the multiplicity of factors involved in such a system and is also often floored by the mass of essential data resisting every effort to be quantified. How, for instance, does one measure the expenses incurred by tourists for enjoying beauty, clear air, or the mental relaxation achieved after a visit to or a stay in a national park? How does one assess in financial terms the value to humanity of saving from final extinction an animal or plant species? How does one cost the service rendered by a wildlife sanctuary as a gene bank? How does one measure monetarily the idea of national pride attached to the possibility of showing other nations the spectacle of a fine system of national parks, well organized, easily accessible and providing visitors with those comforts which they seek? How can this concept of national honour be expressed in cash?

All these considerations combine to underline the fact that econometric methods are hardly capable of judging the worth of national parks to a country or to mankind. Today, national parks are a few remaining islands of unspoilt grandeur. These areas in themselves can uplift our morals and our morale – they play an important part in the rejuvenation of our spirit. How can this possibly be evaluated in terms of money? It is obvious that such an exercise would be futile.

For some time now, it has been accepted that national parks are immensely valuable to countries and their peoples in the important fields of science, recreation and economics. However, national parks are also of great cultural value. The question may be posed: what is culture? Various definitions could be offered, but for our purposes it may be defined as follows: culture is a process of development or refining of the moral and intellectual fa-

culties through education, discipline or training. It therefore is the improvement of man intellectually and aesthetically.

Aesthetic experiences in national parks are more readily appreciated than those referred to as intellectual values. National parks offer opportunities for the appreciation of beauty and the wonders of nature which in turn can be an inspiration for the arts. It is well known that this process has inspired many a composer, sculptor or poet. Unspoilt nature draws out the inherent beauty in man and doubtlessly makes him a better individual. National parks teach us reverence for nature and thereby engage us unwittingly in the anti-pollution campaign. Therefore the inherent beauty which exists in these sanctuaries is transposed on to man and teaches him to be considerate of his immediate surrounding and his overall environment.

Having visited a national park one usually develops a feeling of appreciation for these areas which have been preserved for the common use of the public. Such appreciation strengthens the feeling of responsibility for preserving this heritage for forthcoming generations – which constitutes enhancing the cultural value within the progress of civilization.

National parks teach people their responsibility not to take advantage of society. Lessons in tidiness, adherence to and acceptance of rules and regulations, consideration for the feeling of others are all being instilled upon man whenever he stays, however briefly, in a national park. This is where people can be disciplined not to litter, not to pick flowers or despoil tree trunks by carving initials on stems or branches, not to trap birds or animals for their own selfish pleasure or self-content.

Culturally national parks also generate feelings of independence and self-reliance. Tranquility and associated beauty found in such sanctuaries enhance meditation and peace of mind, so desperately needed today in a world where people are caught up in the tensions of city life. It gives man the renewed opportunity to withstand the stresses and strains associated with the twentieth century civilization. In fact, a national park emphasizes the wonders of nature and the need for reverence for life as a central theme in man's philosophy.

It would seem that wild animals have so far dominated most people's concept of national parks. It is natural that this unique fauna, especially in Africa, should be conserved by man for man for profit, enjoyment and for posterity. However, other aspects should be considered when assessing cultural values of national parks. Why not give thought to the spectacle of cloud formations, the cycle of water in nature, the geological strata upon which we move and which give origin to the soil types and the extraordinary diversity of plant species which are adapted to those specific soils. These phenomena are indeed inherent aspects of national parks, which contribute to man's overall culture.

It is well known that Africa and the world are at present in a turmoil. What is not so obvious however, is that mankind is also faced with an inner crisis. Society is changing in its basic beliefs and also in its structure. People have more leisure time and many leave the countryside to live in cities. This seems to be a world-wide phenomenon. In short, new sets of cultural values

are being developed. The healthy development of any such cultural change requires opportunity for man to reflect on his inner self and on the magnitude of nature. This also implies that the economic climate of a country should be such that people do in fact have time off to reflect, assimilate and practise the good things of life. National parks, properly managed, can contribute tangibly to these very basic needs. If such needs are not met one does not even contemplate talking about culture now or in the future.

The proper use of leisure in any society is one of the measures of cultural achievement. National parks provide opportunities where man may go out into the fresh air to enjoy inspiring scenery, to contemplate the ways of fellow living creatures, and to meet fellow human beings in pleasant, rustic surroundings conducive to fruitful exchange of ideas.

Wildlife Population Explosions: A Problem in Wilderness Management

GEORGE A. PETRIDES

Using the word management in conjunction with wilderness may sound like a contradiction in terms. Yet in national parks and on other wild lands around the world, it is common for hoofed mammals to become over-abundant and to destroy wilderness values. Management of the wilderness in such cases seems to be required.

Before reviewing this matter, it may be well to define some terms. In particular, it seems desirable to identify several important categories of lands related to nature preservation and outdoor recreation. We may define wilderness as any natural area which shows only limited evidence of occupation by civilized man and which is of such size and quality that it contains the complete flora and fauna of the region. National parks are places of natural landscapes and scenery which contain the vegetation and animals native to the region and which are dedicated by highest governmental authority to the permanent preservation of nature and wilderness for the enjoyment, education, and inspiration of the public. In many instances, large portions of national parks comprise true wilderness areas.

From the point of view of nature preservation, key items in both definitions are the words natural and permanent. Wilderness is not wilderness unless it is natural and preservation must be intended for all time. Also important is the aspect of public use. It is only through use of the wilderness that permanent status seems feasible. While even limited public usage would seem to endanger the basic integrity of undisturbed landscapes, visits by an appreciative public tend to ensure that wilderness areas are not reassigned for other purposes.

The paradox that public use is essential to wilderness preservation and yet threatens natural values has long been recognized. Especially in view of this conflict, however, it is essential to appreciate that under certain circumstances nature itself can destroy a wilderness. This danger, too, must be avoided if nature is to be conserved.

In wilderness and other tracts on several continents, excessive populations of deer, antelope and various ungulates (hoofed animals) have developed in recent years with resulting severe damage to the native vegetation upon which they feed. This has been a particularly serious problem in some of the national parks of North America, Africa, and Europe. Ever since first investigating such situations in East Africa in the 1950s^{1 2}, I have seen such conditions become increasingly widespread. Many communities and plant species have become depleted in previously unspoiled areas and the number of animals which have caused the damage has diminished. In addition, other

associated animal species whose existence depended on the same habitats have been seriously affected. In one area studied, overgrazing by hippos eliminated buffalo and kob from several districts and caused reductions in reedbuck. At the same time, increases in bushbuck, waterbuck, warthogs and elephants were induced as heavy bush encroached on the eroded rangelands. Though, as one would expect, some animal species benefited in this case, serious destruction of vegetation and changes in faunal composition were induced. This degradation of a natural ecosystem constituted a severe loss to the integrity of the wilderness.

Could it be, as some people think, that the overpopulation problem resulted merely because the area served as a wildlife refuge? Can wildlife refuges cause problems where big game animals are involved?

A wildlife refuge or wildlife sanctuary – the terms are synonymous – may be defined as an area of suitable habitat closed to hunting and dedicated to the preservation of one or more wild animal species. It need not be a truly wild area.

With regard to wildlife refuges it is widely believed that once established, it is only a matter of time until the wild animal inhabitants become abundant. In fact, the establishment of a refuge does not guarantee increases in wildlife. A refuge does nothing to increase animal life if a factor other than hunting or habitat limitation is preventing increases in the number of animals. The mere passage of laws which restrict hunting or which prevent habitat damage would be just as effective as a refuge and would apply over a wider area. But such laws are useful only if they can be enforced.

Refuges have particular value, then, in regions where either widespread law enforcement or habitat maintenance is difficult to achieve. They are also important where rare animals are concentrated locally and thus become vulnerable to overhunting or loss of habitat.

Most of the world's officially-established wilderness areas are national parks. They also function as wildlife refuges since they provide habitats which mostly are lacking elsewhere and also forbid or tightly restrict hunting.

Possibly it is only the occurrence of favourable habitats or protection from disturbance which leads to overpopulated ungulates in national parks. Or it may be one or both of these factors in conjunction with several years of ideal weather. Or perhaps it is related to a condition reported by Krebs *et al* (1973) for field voles in which a small portion of a more widespread population was enclosed by a low fence. The voles were exposed to overhead predation by hawks and owls and also to the attacks of most carnivorous mammals (which could easily scale the barrier). Yet within the enclosure the animals soon increased and severely overgrazed the vegetation. Outside the fence, in the identical habitat, voles of the same population did not display a numerical increase. Krebs believed that the different densities achieved by these voles were due to the availability outside the enclosure of interspersed poor habitats which some voles penetrated and where they may have perished. Though these small rodents seem not to resemble ungulates, voles are herbivores and ecological equivalents of hoofed animals. Perhaps when restricted

by their habitats to isolated national parks ungulates react similarly to the fenced voles.

We may not often know the exact causes of ungulate population explosions. Nevertheless in national parks and other wilderness reserves it seems almost invariable that these animals become too numerous for the range to support. Perhaps because there is often some mystery as to why big game increases occur, there also tends to be a reluctance by wilderness administrators to "disturb the wilderness" and to undertake control measures.

We would all like to believe that somewhere lands will be preserved which will respond to natural rather than to human pressures. Somewhere, we feel, trees must be allowed to fall and decay without human intervention in order to fertilize new generations of wild forests. But in contrast to trees, which when unharvested merely fall and enrich the site, overabundant herbivores destroy their habitat and themselves. In today's world of limited wild landscapes, over abundant ungulates can destroy the cultural, scientific, recreational and economic values of wilderness on our few remaining "islands" of wild lands. Management controls must be applied in these cases if the wilderness is to be preserved.

The reluctance of wild land administrators to act in big game control may lie in several misconceptions which are widely held by the public and also by some administrators. These concepts do not seem to be solidly grounded, yet they seem rarely to be refuted. The general public seems to feel instinctively, for example, that in the distant past nature was "in balance". The common belief was that herbivores gently cropped the lush vegetation, predators permitted only "moderate" herbivore densities to occur, and all animals were "born free" to live happy lives. A wilderness today, it is held, should be just like that. I know of no evidence for this popular steady-state paradise. A large proportion of the plant and animal species now alive are creatures of eroded, depleted and disturbed environments. They could not have survived to the present day if only climax conditions prevailed everywhere.

It seems a more logical proposition that through the ages there were alternating periods and areas of habitat destruction and recovery.³ Large herbivores would over-utilize a locality so that it became unsuitable for them. Then the population would become much reduced or die out. In other areas recovery from such destruction would be under way. The difference between the overall conditions in ancient times and now is that once there were vast areas of lands available on which natural fluctuations could occur. Unlike today, there was always some place in which remnant populations of destructive herbivores could survive and from which they could spread to restock recovered habitats.

The belief that predators normally control ungulate numbers also is seldom justified. Carnivore populations studied in recent years have been observed to limit herbivore numbers only under rare and local circumstances. Normally either the scarcity of prey causes predator numbers to be limited or, if herbivores are common, large carnivores limit their own densities through agonistic behaviour (they fight each other and kill their young). In a number of overgrazed African wilderness areas, for instance, lions, leopards,

cheetahs, hyenas, wild dogs, jackals and many lesser meat-eaters are present and evidently are as abundant as they ever were.

The only predation now absent from most wilderness areas is hunting by man. It is possible that persistent hunting even with primitive weapons could limit prey populations in some situations.⁴ Modern man has failed however to limit most game populations even using severe hunting pressure and efficient weapons. There is little support, therefore, for the theory that early man had widespread effects on any except possibly the slowest-breeding vertebrates.

Another frequent belief⁵ is that excess populations will develop in a refuge and then flow out to restock surrounding areas. To some extent this does occur, of course, but for ungulates it does not normally happen until extensive damage has been done within the refuge habitat.

Perhaps of greatest importance in the entire problem of over abundant ungulates is that nearly all of even the largest national parks and wildernesses exist as "islands" in a "sea" of lands modified for other uses. On such islands, as a consequence of area-limitation and at least occasional catastrophes, wild species and biotic communities are exposed to extinction.^{6,7} Furthermore, if these islands of wilderness are destroyed even by natural forces, is it likely that in an industrial and overpopulated world, they will be set aside for several centuries or millenia so that they can restore themselves? Certainly, this would not happen; the island-wildernesses would be lost, so far as we can see, forever.

Some day chemical reproductivity inhibitors may become a practical birth control procedure in wild ungulate management, perhaps as incorporated into salt blocks. But, for now, only careful and unobtrusive cropping seems to be a feasible method to limit the number of hoofed mammals. Decisions will have to be made whether hunting is to be undertaken by local staff, by professional hunters, or by the general public. Such decisions must be based, of course, on the nature of the area's principal values and its sources of political and financial support.

For some hoofed animals, population reduction by hunters is difficult to achieve; and once reduced, ungulate herds will reproduce and survive at enhanced rates. Continued management of ungulate herds is likely to be necessary on all wilderness areas in which they occur.

In summary: on unmanaged wild areas which contain populations of hoofed mammals, several factors commonly combine to threaten wilderness values.

1. Under the favourable refuge conditions which prevail in many of the world's remaining wilderness areas, "big game" populations tend to increase.
2. Beliefs that nature ever was "in balance" on local areas may not be valid; and hopes that nature will restore itself in damaged wildernesses today are generally unrealistic.
3. Ungulate populations characteristically are not held in check by predators. Neither can they be expected to "flow out" from crowded habitats, except after serious damage is done to the wilderness.

4. Wilderness areas today mostly exist as "islands". As such, resident species are vulnerable to catastrophes and hence to extinction; and once destroyed, present-day wilderness tracts cannot be held over the centuries pending natural recovery.
5. Despite its complexity, the problem of over abundant ungulates in wilderness areas is unlikely to vanish. Many wildernesses, it seems evident, will require management in order to retain their wilderness character.

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Natal Parks Board and Wilderness

J.T. GEDDES PAGE

The eleventh annual report of the Natal Parks Board for the year April 1958 to March 1959 records: "Some 12 150 hectares were set aside by the board as a wilderness area, in which all forms of motor traffic are prohibited, and only rangers, or visitors on foot accompanied by a ranger, are permitted to enter. The idea of wilderness trails originated from America and was introduced into South Africa for the first time by the Natal Parks Board. It is believed that a trip of this nature affords the average urban dweller a better understanding of nature, and trailers are assured a sight of the famed square-lipped rhinos and countless other animals of many species.

"These tours, conducted under the personal supervision of a European ranger, cover approximately ten miles per day with two night stops, so that a total of approximately thirty miles of walking is involved. Transportation of food, bedding and changes of clothing is effected by animal transport. All trails start from the hutted camp."

The background to this admirable action started with discussions between Jim Feely, then a ranger in the Umfolozi Game Reserve and his senior ranger, Ian Player. The latter enthusiastically sought the support of his director, Colonel Jack Vincent, who sent the author to Umfolozi to test the practicability of the proposals. All concerned then combined to seek the approval of the Natal Parks Board which finally set aside Natal's first wilderness area in the Umfolozi Game Reserve in 1958.

As the years unrolled, other wild areas at St. Lucia, Giant's Castle and the Mkuzi Game Reserve have joined the original one and have given tremendous pleasure to ever increasing numbers of our population and our visitors. But there are problems. Firstly, there has developed an unfortunately emotional approach to wilderness – so much so that growing numbers of conservationists are considering dropping use of the word in our context. Secondly, the Department of Forestry has (since the board set aside its first wilderness) defined wilderness areas in its legislation and proclaimed a number in various state forests. This action has brought into being a legal definition which, in fact, refers only to forestry wildernesses and in the opinion of the author that word forestry should have been included with the word wilderness in that legislation, because it is certain that that department has no monopoly upon wilderness as we understand it and indeed we do not wish it thought that our contribution must or even should fit that of the Department of Forestry – or indeed anyone else's definition anyway!

What is required, in my board's view, is that naturally wild areas need to be identified and reserved, but not for the chosen few; on the contrary these wildernesses should be made as available as possible to as many

people as possible, short only of numbers which could impair enjoyment of the basic wilderness quality of the area.

In the 15th Horace M. Allbright Conservation Lecture, Ansel Adams, the artist, wrote, "Exclusion is, for me, a bad word indeed. I want people to experience Yosemite and the Sierra. The Sierra Club outings were conceived to acquaint people with the beauty of the Sierra and enlist their support in its preservation. . . 'to experience' need not imply 'to destroy'. For a few hardy souls to demand the sealing off of the wild places represents a brutal policy I cannot condone. I am anxious, however, to promote the essential controls that will limit use . . ."

The Natal Parks Board is happy to have wilderness areas designed for use by many in terms of the board's own criteria and under its own control. It is satisfied that it is capable of managing such areas responsibly and properly, including providing what it believes should be provided and resisting the provision of what it believes should not be provided. The board does not wish to be expected to conform to the dictates of others, but has provided and will be happy to continue to provide its own wilderness facilities subject to its own control.

South Africa's first formally set aside wilderness area was, so far as we know, the one in the Umfolozi Game Reserve, where trails commenced in March 1959, run at two-weekly intervals. The position today is that three full-time trails rangers conduct some 144 trails a year involving 864 visitors in the

Umfolozi wilderness trail.



original 30 000 ha wilderness areas. Meanwhile the Wilderness Leadership School conducts about sixty trails annually for an additional 420 people a year, in the adjacent corridor.

Six overnight trail camps and two base camps exist, one of the latter at Mhlologazane (Mhlopene) to the west and the other at Mdindini at the northern end of the area. Members of the public spend the first and last nights in the base camps with two nights at trail camps. The distance walked each day is optional; in fact the trail ranger uses camps so as to select distances to suit the relative fitness of the parties involved. It is naturally easiest when pre-arranged groups (personally known to one another) form the trail party. Donkey transport is used to cart food and equipment.

Attractions include viewing such big game as white and black rhinos, buffalo, giraffe and lion in addition to smaller species, and enjoying the general wild atmosphere of this piece of "old Zululand". The riverine vegetation includes magnificent trees, like the *Schotia brachypetala* (Boerboom) covered in beautiful blossom in season.

Grave concern is the order of the day, however, because of the possible loss of some of this riverine magnificence along the river if it is to be inundated by the waters of storage dams which must be built along the course of both the black and the white Umfolozi rivers.

The fact that approximately one applicant among every five would-be trailers actually enjoys the experience indicates that the demand greatly exceeds the supply. We are grateful indeed that the Minister of Water Affairs has set up a committee to study and report upon the environmental impact which the construction of various feasible dams will have upon this wilderness environment. No effort will be spared to try and influence the dam builders to choose sites which do not adversely affect the integrity of this proclaimed reserve area.

Trails were also started in the St. Lucia Game Reserve and Park in 1959. The converted life-boat *Luabo* – recovered from the beach of Tongaland and equipped with sail-transported trailer to the Mkuzi river mouth at the northern end of St. Lucia lake, passed Bird Island to land its passengers at a trails camp at Sengwane. From here some forty km were covered on foot on the eastern shores to see the swamp forests and even the beach returning to Te-wate to rejoin *Luabo* for the return trip to the western shore. Trail duration varied from three to four days and frequency from one to four a month during the cool half of the year.

The area involved is some 15 000 ha of land and approximately 25 000 ha of water, with possible extensions of a further 45 000 of state forest, provided military activity (which threatens this wilderness as the dams do Umfolozi) permits.

Walking invariably covers from ten to fifteen kilometres a day and the trails last five full days involving four overnight stops. Points of interest include the second highest forest-clad coastal sand dunes in the world, fascinating swamp forests, grasslands and, of course, the swamps themselves. A very rich bird life, crocodiles, many hippopotami and South Africa's best

population of reed buck (some 2 000 head) make this a worthwhile wilderness experience.

At St. Lucia twenty-eight trails involving some 180 people operate each year. The demand here is similar to that in respect of the Umfolozi trails.

The wilderness area in Giant's Castle Game Reserve is one of limited development where the chances of encountering other visitors is small. It would perhaps best be described merely as a wild area and its northern boundary follows the southern boundary of the Department of Forestry's Mdedelelo wilderness area.

Vegetation types vary from alpine sourveld through highland sourveld with a good podocarpus forest on the south-facing slopes of the Little Tugela or Injasuti River, all in an excellent state of preservation. The large mammal population consists mainly of eland, vaal rhebuck, mountain reedbuck, duiker and bushbuck. Such fascinating birds as the lammergeyer, the black eagle, jackal buzzard and cranes (in season) add interest to the area. Rock paintings are to be seen in most of the caves in the sandstone cliffs.

Last year trails on foot and on horseback provided for 516 visitors, whilst some 2 000 did the short walk to Battle Cave to see the best of the rock paintings. In the same period more than eleven thousand visited the camp and picnic areas in the Bushman's River valley to the south.

February 1976 saw the start of trails into the wilderness area of the Mkuzi Game Reserve. Trailers spend three nights out, carrying all their needs to the

Rangers on patrol in the Umfolozi Game Reserve.



two camps established in the gorge area of the Mkuzi River. A full-time trails officer for Mkuzi awaits an increased fiscal provision to cover this additional need. Meantime the regular field staff double as trails personnel as in earlier days in the other cases mentioned above. This limits trail activities at present to two trails a month.

All of the areas mentioned are very popular, and pressure continues for larger wild areas and more wilderness staff.

The board's policy can perhaps best be expressed as follows:

- (a) The primary objective of managing all its nature conservation reserves, including its wilderness areas, is to protect the areas for the benefit of future mankind, and the secondary objective is to allow current generations to enjoy the use of the areas to the maximum extent compatible with the primary objective and their own enjoyment of the areas concerned.
- (b) Legitimate human enjoyment of such natural areas includes study, education, rest and particularly mental relaxation. The board recognizes that for a significant proportion of mankind, fulfilment of their enjoyment involves "getting away from it all" and "getting back to nature". The board has therefore managed, and intends continuing to manage, some of its reserves, or parts of them, to fulfil this need. The essential aspects of this management are the limitation of man-made structures and changes, and the limitation of numbers of people to the extent necessary to prevent over-crowding.

An additional purpose of such management is to preserve for posterity some examples of South Africa's landscape in the most natural state possible, since so little land remains in this condition.

- (c) In this context, the board is involved with two categories of land. The first may best be termed wilderness area although the use of this term does not imply that the board necessarily accepts all the often arduous standards imposed by the current popular (particularly the American) cult and concept of the term wilderness. South Africa has insufficient natural countryside left to justify the restriction of large tracts of it to a particular and comparatively small and very fit section of the community. Nor is it always feasible to meet the minimum limits on size or remoteness imposed by some definitions of wilderness.

The board's concept of a wilderness area therefore does not exclude an area on the periphery of which are placed small, well-spaced, aesthetically-pleasing camps for visitors, from which they may go as far or as short a distance into the area as they wish, or where they may simply rest and be rejuvenated by their surroundings; a game-viewing road may also be routed around the periphery. Within the wilderness area temporary overnight facilities may and in some cases already do cater for those travelling through it on foot, horse or canoe trails; man-made structures and changes will otherwise be limited to those essential to conservation management.

- (d) The second category of land in this context may best be termed wild area. These are areas whose natural character and appeal to mankind would be

adversely affected by man-made structures other than visitor facilities of the simplest and most harmonious kind, such as mountain huts and paths, and those necessary for management, but where it is unnecessary or impracticable to apply the strict standards of wilderness.

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Wilderness and the Israelites

H. EBEDES

The biblical description of the exodus from Egypt, which portrays how an estimated population of some 600 000 men wandered, lived and survived in the Sinai wilderness for forty years, somehow defies logical credibility by today's standards. It is unlikely that so many were able to find a livelihood in the Sinai as we know it today, and it is probable that only a few thousand actually led a nomadic existence in the wilderness.¹ It is, however, significant that during their wilderness experience, this undisciplined, motley collection of slaves – a very primitive people – accepted monotheism and under divine inspiration formulated a code of ethics, morals and culture which allowed them to survive as a people until the present time, whereas the great pagan nations of the same era such as the Babylonians, Persians, Phoenicians, Philistines, Romans and others ceased to exist on this earth.²

The Mosaic writings contain many laws which can be classified broadly under sections such as civil government, military laws, judicial system, criminal law, marriage, sanitary, health and dietary laws, individual conduct, real estate and business practice.³ Tucked away among the many laws and stories in the Old Testament are several conservation concepts and one need not delve too deeply into these scriptures to find a clear message that it was God's intention for the Israelites of old and for modern man to protect and conserve wildlife and wilderness areas.

I must emphasize that I am not a biblical student nor a "Bible-puncher" and in this brief review wish only to draw your attention to a few thoughts which may be pertinent enough to interest conservationists.

In these changed and turbulent times when everything seems to be disrupted and out of balance it may be wise to take another look at the Bible and try to draw some inspiration and renewed values from it.

In the very beginning, after the creation, God gave man "dominion" or control over the earth, the fish, the birds, animals and insects⁴, and he allowed man to name each species.⁵ In the Garden of Eden, man was instructed to "dress it and keep it"⁶, a clear instruction to conserve his original undisturbed habitat.

At the time of the great flood, which was preceded by paganism and much evil on earth, Noah was instructed to build an ark large enough to accommodate not people but animals. Two of every kind, mammal and insect⁷, were to be saved from extinction. We presume that the two of every kind meant one male and one female of the species so that they could propagate after the deluge. The conservation concept here is very powerful and in conserving the wild animals, the wilderness areas in which they were intended to live were consequently conserved. It is of interest to note that Noah did

not have to collect or capture the animals because they came to the ark on their own under divine inspiration.⁸ The animals were God's supreme ownership and he insisted on their preservation.

There are very few indications that the Israelites hunted animals for food or sport, a practice which judging from ancient drawings was very common among the other nations. The reasons for this were the strict and prohibitive laws which forbade the eating of blood⁹, the eating of unclean animals¹⁰, the eating of carrion.¹¹

The interpretation of carrion is given as any animal suffering or dying in pain, and of course dead animals. Other nations had brutal slaughtering methods and killed by clubbing, shooting, strangulation, puncturing or repeated incisions with sharp instruments.¹² The humane laws against cruelty to animals resulted in the well known "kosher" or ritualistic slaughtering methods which also ensured complete draining of blood and the prohibition of eating and drinking blood. These laws therefore effectively prevented the eating of hunted and wounded animals and even to this day hunting is almost unknown among Jewish people. I have never met a Jew who hunts big game. The killing of any animals, other than for food, was regarded by Jews as offensive and against the natural order.¹³

The prohibition against eating "unclean" animals, which included all the carnivores and predators on land, in the air and in the sea, safeguarded the continued existence of these species in their natural habitats. If they could not be eaten, why go to the trouble of hunting them? Marauding predators which attacked man or beast could, however, be killed as we have seen in the case of Samson, David and others.¹⁴ Lions and leopard were plentiful in the wilderness of ancient Palestine. Wildlife abounded and even the hippopotamus was found in the Jordan River.¹⁵

Domesticated fowl were unknown in ancient times and a special law protected wild birds.¹⁶ This law is, as far as I can determine, the first written conservation law and forms the basis of every conservation concept. In Deuteronomy 22 : 6 & 7 we read: "If a bird's nest chance to be before thee in the way, in any tree or on the ground, with young ones or eggs, and the dam sitting upon the young, or upon the eggs, thou shalt not take the dam with the young; thou shalt in any wise let the dam go, but the young thou mayest take unto thyself; that it may be well with thee, and that thou mayest prolong thy days."

This important law not only has strong conservation principles for all wildlife but is also an act of mercy. It is of interest to note that this is one of the few occasions mentioned in the Bible where man is rewarded for his deeds: "that it may be well with thee, and that thou mayest prolong thy days."

The forty years of wandering in the wilderness, living mainly on manna, was difficult for the spiritually-weakened, demoralized Israelites and we read that they often yearned to return to Egyptian bondage. They suffered many hardships and could not easily accept their new morality and freedom. This wilderness period of humiliation, suffering and loneliness was essential to conquer their slave-mentality, to purify and revitalise their spiritual

health. Moses, that great leader of mankind, also spent many years in the wilderness in preparation for his great task of leading the Israelites to their new homeland.

The logo and theme of the first World Wilderness Congress is a green *Erythrina caffra* leaf. Let us take a "single green leaf" out of the Israelite wilderness experience. The message is very clear that wilderness and all it contains was intended to be left undisturbed as wilderness for the sake of wilderness, and is essential for man's survival.

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The Selection, Planning and Administration of Canadian Wilderness Areas

LLOYD BROOKS

The opportunity for setting aside wilderness-type reserves in Canada has long been recognized. The country's very size, diversity of terrain and climate, and relatively low population compressed into ten per cent of its territory, mainly along the southern border, all tend to facilitate designation of the type of large natural reserve usually categorized as wilderness. Further to this, over ninety per cent of Canadian terrain is in public ownership, which increases the options open to the various levels of government in the designation of lands for special purposes. Except in the case of the northern territories, responsibility for the allocation of natural resources in Canada lies with each of the ten provinces. In the two territories it is a Federal responsibility.

This means that only in the northern territories can land be set aside under Federal legislation without consent and agreement from another level of government. Although several of the large, wilderness-type national parks were set aside before transfer of resources management to the provinces in the mid-thirties, a substantial number of national parks has been added to the system since that time. In other words, there has been a commitment to the concept of reservation of large natural areas by both levels of government in Canada for many years.

Further to this, provincial park systems have evolved under provincial legislation for over eighty years. Many of these provincial parks are of a size and are managed under policies or are zoned in such a manner as to preserve wilderness values. This is especially so in more recent years as the motivation to set aside large parks has tended to swing from that of tourist attraction to preservation of representative biophysical zones.

The philosophy and concepts behind wilderness reservation are now well understood and strongly supported throughout Canada, both within agencies of government and through numerous citizen organizations. The latter exert considerable pressure on governments to reserve many natural areas within the total complex of resources allocation and management. Their success can be measured not only by a resurgence of reservation of large wilderness-type national and provincial parks in recent years, but also by the increase in the identification of wilderness potentials through zoning of existing large parks.

Since designation of the first natural parks, Banff National Park in 1885 and Algonquin Provincial Park in 1893, there have been close to 2 000 national and provincial parks set aside throughout Canada for a total area in excess of thirty-three million hectares or about 3,4 per cent of the total area of Canada.

About a half of this substantial land area could be categorized as fully protected wilderness-type park, if one takes the generally accepted definition of wilderness as a large natural area maintained for the purpose of providing an outdoor recreation experience in protected, near-natural surroundings free from motorized transport or from facilities of an intrusive or permanent nature.

I should like to caution against too rigid a definition of wilderness based on arbitrary size or too pure a concept of what is natural. Surely a basic purpose of wilderness preservation is to provide man, all people, not just scientists, with the special experience of a natural or near-natural environment, free from the trappings, noise and odours of man's more usual surroundings? I contend this can be achieved through a range of natural areas, from a few hectares perhaps artificially nurtured in the shadow of the cities to very large areas well removed from the modifying influences of man.

The current response to this need in Canada has been mainly through zoning in the planning process of natural parks. Particularly in the Federal parks system, this has been done to reconcile the dual mandate of preservation versus recreational use. Only a very small proportion of protected lands has been intended for scientific study, mainly those numerous but relatively small sites under the ecological reserves of the International Biological Programme.

The Federal zoning system, now applied throughout thirteen million hectares of mainly large national parks, consists of five zones based on resource sensitivities and land use capabilities. It is actually a planning and management tool related to the natural values found in the various areas and governing the application of policies. The basic objective is to protect and to preserve park resources, yet to provide a high quality visitor experience, now and in the future.

Although the word wilderness is not used in defining any of these zones, the concept of wilderness is implicit in the criteria for the top three zones which comprise the greatest area of the national parks system. These are referred to as the special preservation zone, the preservation-primitive zone and the natural environment-outdoor activity zone. Motorized transport is not permitted. The two other zones are the recreational facilities zone and the visitor services zone which, as the names imply, permit modern modes of travel and development of recreational facilities of a permanent nature.

Although all five zones are not found in every national park, it is intended that each park will have at least two zones, a protective zone (one of the first three zones mentioned) and a visitor-use zone.

Official recognition is given these zones in the required master plan for each national park. Although zoning is not a legislative requirement, the present policy of public involvement in the preparation of master plans through a series of hearings gives some assurance of permanence to the zoning boundaries.

Under Canada's extensive provincial park system, comprising over twenty million hectares of mainly natural areas, the wilderness concept is

also accommodated primarily in the zoning and planning process rather than through legislation specifically naming and describing wilderness. Four provinces mention wilderness specifically in their legislation and a fifth, British Columbia, includes a nature conservancy category in the provincial park act. Only the province of Alberta, however, through its Wilderness Areas Act of 1971, has comprehensively defined the purpose and limitations on designated wilderness areas. Alberta currently has three wilderness areas comprising approximately 100 000 hectares set aside under this legislation.

The approach by the province of British Columbia is through the legislative authority of either the Park Act or the Environment and Land Use Act. In the former, provision is made for nature conservancies, a special zone in a provincial park managed as a wilderness area. It is defined as a roadless area retained in natural condition for the preservation of the ecological environment.

One large wilderness area, the Purcell wilderness area, has been set aside under the Environment and Land Use Act but management of the area is assigned to the provincial park branch. More recently, a wilderness park of 667 000 hectares in extent has been set up under the Park Act, Spatsizi Plateau Wilderness Park, in which, for the first time, the wilderness purpose is set forth in the Act.

The latter two cases may well presage a new stage of wilderness recognition in British Columbia where wilderness is set aside separately from parks under independent legislation and with specifically stated goals and objectives. There are two bodies of opinion on this subject. One would contend that through comprehensive zoning and sound planning of natural or near-natural parks, wilderness values can be adequately defined and protected against resource exploitation or incompatible recreational developments. Another opinion is that wilderness should be clearly separated from parks through its own legislation defining the goals and the acceptable management practices.

I would suggest both approaches are acceptable and the course chosen may well depend upon a country's stage of park development and natural resource limitations. In fact, I believe that on a worldwide basis many options are available to achieve the basic objective of preserving the prime natural areas against irreversible change through developments or misuse. Diversity of approach must be the key to fit the particular opportunities and limitations of a land and its people.

I would like to describe a resource classification system being applied by Parks Canada and used as the guide to new park designation. This system may well have worldwide applications as a framework for a global plan of wilderness areas representing the various biophysical regions of the world. It is not an entirely new concept, and a number of studies have already been done aimed at devising a suitable classification of the world's biotic areas for conservation purposes.

The Parks Canada system divides the nation into forty-eight natural regions, thirty-nine terrestrial and nine marine. These natural regions are based on such factors as physiography, biology, geography, geology and/or

oceanography. "The Natural Regions are defined as natural landscapes and/or environments of Canada which may be separated from other such landscapes and environments by surface features which are readily observable, discernable and understandable by laymen as well as by scientists and others more familiar with the natural features of Canada."

These forty-eight natural regions have become the framework for expanding the Canadian national parks system in an orderly manner assuring adequate representation of the various regions of Canada. The objective is to have at least one national park in each natural region.

There is merit in pursuing this concept with the objective of developing a global system of wilderness areas as an important element in the world list of protected natural areas. In fact, there would seem to be need for some pulling together of the various world systems of protected areas, such as the United Nations list of national parks and equivalent reserves, and the ecological reserves of the International Biological Programme. What we are probably all searching for is a worldwide system of protected natural areas, based on biophysical (or biogeographical) principles, ranging from the smallest ecological reserve of a few hectares to very large wilderness regions.

Through such a correlation of systems every country might well participate in scale with its resources and economic limitations.

Important as the need may be to develop a worldwide system of protected natural areas, of which wilderness areas are a vital component, it is even more important that such a system retain its integrity in the face of the perpetual search for more exploitable resources. The elements of a system based on a biophysical classification, with international acceptance, would probably have more chance of survival than would isolated projects based on sentimentalism.

However, an even greater factor guaranteeing survival of such special areas is that they be selected as part of the total process of resources analysis planning and allocation (integrated resource planning) in a particular region. To ignore the realities of burgeoning human need for energy, raw materials and food products is to guarantee eventual loss of protected natural areas, no matter how enshrined in legislation or how scientifically selected for their natural values.

We all deplore the loss of a great park or natural area and perhaps are too prone to condemn the pressures of resources exploitation rather than determining if the formerly protected area was well chosen in the first place or correctly classified. There is little doubt that in an energy and food deficient world pressures on undeveloped areas will become much greater in the future.

The best guarantee for perpetuation and extension of our natural parks and wilderness areas is to interrelate them in a worldwide system of protected areas, where each element of the system has been chosen not only because it ideally represents a certain biophysical zone but because it has a place in the overall integrated resources planning for a particular state or region with due regard for the food, energy and raw material demands of the future.

I would urge support for such a global approach in wilderness designation.

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The Wilderness Concept and the Wildlife Society of Southern Africa in the Year 2000

DR J. HANKS

The Wildlife Society of Southern Africa has always actively campaigned for the creation of wilderness areas and will continue to support their maintenance in the future.

But will these wilderness areas still be with us in the year 2000? My reason for this question stems from the fact that the wilderness areas and the national parks and game reserves of Africa are being threatened as never before by the direct and indirect consequences of exponential human population growth. In nearly all of Africa this problem has become particularly acute, and all conservationists should be aware of the need to give careful consideration to the definition of priorities for action in the field of conservation and integrated resource planning if the wilderness areas are to remain inviolate by the year 2000.

Every person concerned with conservation should be thoroughly familiar with the relevant statistics of human population growth. It is a mere eighty generations since the birth of Christ, but in that period the population of human beings has increased to over 4 000 million. In the year one A.D. the estimated world population was about 300 million, and it took up to 1830 to reach the first 1 000 million individuals. In 1930, a hundred years later, the population reached 2 000 million, to be followed only thirty years later by another 1 000 million people. In 1976, only sixteen years later, the population reached 4 000 million, and at present is growing at just over two per cent per year, a doubling in less than thirty-five years. I would like to stress that the danger of exponential population growth is that the consequences are realized usually when it is too late.

In a recent very important speech, the president of the World Bank, Robert McNamara, stated that short of thermonuclear war itself, the problem of population growth is the gravest issue the world faces over the decades immediately ahead. He said: "Indeed, in many ways rampant population growth is an even more dangerous and subtle threat to the world than thermonuclear war, for it is intrinsically less subject to rational safeguards, and less amenable to organized control." In the same speech, McNamara pointed out that although fertility has declined in recent years in seventy-seven of eighty-eight countries for which estimates are available, the fact remains that the current rate of decline in fertility in the developing countries is too slow to avoid their ultimately arriving at stationary populations far in excess of acceptable levels. He said: "Unless Governments, through appropriate policy action, can accelerate the reduction in fertility, the global populations may

not stabilize below 11 000 million. That would be a world none of us would want to live in."

And of course that would be a world where the pressure on wildlife would be difficult for us to comprehend.

South Africa has no grounds for complacency. At the turn of this century, the human population was about five million. By the end of this century there will have been a ten-fold increase to fifty million. Each day 1 900 people are added to South Africa's population, and each year a staggering 210 000 new workers are added to the labour market in this country alone. Each worker will require a job, making even greater demands on our renewable and non-renewable natural resources.

I make no apology for dwelling on these population statistics; I suggest that conservationists cannot afford to remain neutral on this subject.

I would like you to think carefully about this next point. At the 1974 United Nations world population meeting, the developing nations said, incredible as it may seem, that they have no population problems. Furthermore, they agreed on two basic issues: the hungry nations have the "right" to produce as many children as they please; the developed nations have the "responsibility" of feeding them.

Surely these statements are irresponsible and indefensible? Any nation that asserts the right to produce more children must also assume the responsibility for taking care of them. There can be no moral obligation to do the impossible.

It is of course inevitable that as populations grow, they exert increasing demands on the available natural resources. Unfortunately, far too many people take the ready availability of renewable natural resources completely for granted, simply because they form a part of a renewable cycle, and supplies appear to be unlimited. An example is water. Civilizations have grown up around water and have died because of mismanaging it. A recent United Nations water conference highlighted the unexpectedly large amounts of water required for everyday use. For example, 10 000 litres of water are required to produce twelve large eggs in industrialized countries. One orange requires 500 litres, and one kilogram of prime beef requires 3 000 litres. Industrial use is even more frightening. To produce one car, 450 000 litres of water are required. The world demand for water will more than double before the end of this century, and many parts are even now facing an extremely grave water crisis. South Africa can anticipate a continued exponential growth in demand for water, and already the magnificent wilderness area in Umfolozi Game Reserve is being directly threatened by at least one major dam that will have to be built to supply us with our needs.

Another even more striking example of the threat to wildlife and its habitat is presented by man's never ending demand for food. Last year, some twenty million deaths could be attributed directly or indirectly to starvation and malnutrition, and there is every reason to believe that this year will be no different. By the year 2000, the situation will be extremely serious, as the amount of land cultivated per person will probably be cut in half. The world population will have increased by another 2 000 million to 6 000 million, and

although another 300 million hectares will be added to land under cultivation, 300 million hectares will be lost to urbanization, and 300 million hectares will be lost to soil degradation.

This world-wide scourge of man-made deserts now afflicts some 680 million people in sixty-three countries. The effects in terms of human suffering are appalling. As each year goes by, deserts are claiming another five to seven million hectares, equivalent in area to two Belgiums! The reason for this is misuse of fragile land. As the plant cover is destroyed, so erosion increases, leaving only the dry bones of land – hard, sterile and unproductive. We must also not forget that the gathering of wood for fuel has few equals as a desert maker. Parts of South Africa are already experiencing a firewood crisis, although the situation is nowhere near as serious as in the Sudan, where an estimated 548 million acacia shrubs are used every year for cooking food – not just cut down, but pulled up so that regeneration is impossible. In parts of the Sudan, the desert has moved 200 kilometres south in the past eighteen years. On a world-wide basis, the present rate of soil loss could be as high as 2 500 million metric tons per year, over half a ton of soil for every man, woman and child on the planet. We seem to be caught in a vicious and inevitable spiral of land degradation; each year less land is available to feed more and more people. The threat to the wilderness areas and all other wildlife sanctuaries must be obvious.

Before the end of this century it will become increasingly difficult to justify the continuation of many of the national parks and game reserves of Africa when they are surrounded by hungry people living on, and trying to obtain a living from, overcrowded and badly managed land. Natal already illustrates the dilemma facing the conservationist. Approximately 2,2 per cent of the province is land managed by the Natal Parks Board, and a great deal of effort, manpower, money and expertise is tied up in the careful management of this small part of the province. And yet, in the thirty per cent that constitutes neighbouring KwaZulu, we look over the fence and tend to ignore the fact that the human population will double itself before the year 2000 in an area where dongas are five metres deep, and 200 million tons of soil are being washed into the sea each year.

Is that really what we want? Is that really what conservation is all about? We are looking after our little pockets of land, and forgetting what is happening in the surrounding areas. Surely, as responsible citizens, we must concern ourselves with the whole environment, and not stop at some artificially created man-made boundary.

We are ignoring the conservation of the most vital component of all – the soil of South Africa – and for that we will never be forgiven.

We must open our eyes and accept that a realistic philosophy for conservation must be connected with the survival of man himself, and this philosophy must also accept the fact of interdependence of all living things.

If we accept this philosophy, will there be any place for wilderness areas in the year 2000? I believe the answer is yes, but only if we have the courage to tackle three vitally important and interrelated issues: a reduction in the human population growth rate; a new approach to integrated resource plan-

ning; and finally, a complete reappraisal of the present system of conservation education.

Some of the world's leading conservation organizations have already made a stand on the population issue. For example, at the third international congress of the World Wildlife Fund in Bonn on 5 October 1973, the congress "identified the human population explosion as the prime cause of the environmental crisis, and affirmed the conviction that all governments should consider world policies directed towards the stabilization and ultimately the reduction of populations according to the carrying capacity of the land and oceans. Such measures are of the highest priority not only in the interests of conservation of natural resources but also for achieving the highest quality of life for mankind." Quite clearly, exponential growth of people and livestock, and exponential consumption of natural resources, cannot continue indefinitely in a finite world. All countries must recognize this fact, and have the courage to overcome religious and political difficulties and put forward a declared population policy which defines an optimum population size that will conserve all natural resources and enhance the quality of existence of people of all races. We must accept that high population growth rates will not be checked by "family planning" on its own, and consequently a declared population policy is the only alternative. We can avoid a world of 11 000 million people and all the misery that such an overcrowded and impoverished planet would imply. But we cannot avoid it by continuing into the remainder of this century the completely ineffective approach to the problem of population that has characterised the past twenty-five years.

Here in South Africa I recommend that as a start every effort should be made to promote the creation of a multiracial working group to look into all aspects of this difficult problem, including recommendations for the required sociological research.

There is an urgent need to get away from unplanned settlement of people on land totally unsuited to primitive subsistence agriculture and to replace this with comprehensive land-use planning and zoning. Food production must of course rate as a very high priority, and lands of high potential for agriculture will have to be used accordingly. All those lands of a low potential for agriculture should be assessed for their possible use for ranching, forest management, wildlife management, or multiple land-use purposes. In other words, a positive rural land-use strategy is required which recognizes the prime importance of food production, but at the same time safeguards soil, habitat and wildlife.

What a far cry this approach would be from the present unrealistic and irresponsible system of land usage in much of the African continent.

In South Africa, before any comprehensive land-use planning can take place, the first priority is to build up an adequate resource data base, and here I suggest we give the strongest possible support to a proposal made by Professor Brian Walker (in his inaugural lecture at Witwatersrand University in 1976) for a national institute of natural resources. The main feature of this institute would be a computerised natural resources data bank. We must have these basic data, readily available, for all aspects of our land-use plan-

ning. This is a new and exciting field, and South Africa has the potential to take the lead here and set an example for the rest of the continent to follow.

Far too many people regard conservation as a remote, academic luxury-subject, and this is a most unsatisfactory state of affairs. Conservation education should be broadened to include the topics discussed here, and should have the overriding theme that conservation is intimately connected with human survival. In this revised form, conservation education should be a compulsory part of primary, secondary and tertiary education throughout Africa. In the interest of the preservation of wilderness areas we should make environmental awareness a vital, dynamic subject.

At this point in time, perhaps as never before, there is a need for clarity of mind in defining our objectives and priorities for conservation in Africa, coupled with the need for conservationists to proceed with the utmost integrity and diplomacy if they are to achieve these objectives.

A job of heroic proportions lies ahead of us. We owe it to posterity to promote conservation policies that lead to solutions instead of to catastrophe.

Comments on the World Wilderness Congress

IAN PLAYER

I would like to thank everyone who came to this congress and I think it can quite honestly be said that it has been a happy affair – happy, despite the many unpleasant facts facing the survival of both wildlife and man.

I asked Magqubu Ntombela, who as you all know, does not speak English and cannot read and write, what he thought about the congress. This is the gist of what he said: even without being able to understand the speakers, he could perceive that the men were of great ability and all spoke from their hearts, and from their faces he could see that their approach was honest – a fact which was borne out by the sincerity of their messages. It pleased him to see how the different races had all come together and he felt that God had wanted the congress to happen. He said he was greatly impressed and admired the visitors who have travelled so far from across the sea, particularly the Australians, whom he believed came from beneath the sea. It showed there was a stewardship of conservation not only in Africa but beating in the hearts of many men all over the world. He also voiced what many people said, that the main resolution should be that every individual who attended this congress ought to make certain that he or she decided to do something personally, because it was too easy simply to ask other people to do things – that the answer to everything lay within ourselves.

I notice there were comments about talking to the converted at this congress. I would like to think otherwise because I saw many people who were not involved in conservation matters – businessmen, doctors, lawyers, and all sorts of other people.

Concerning involvement, I have heard comments about press coverage, and I should like to suggest that each delegate and person concerned with this congress involve the media in all projects they undertake, whether scientific or otherwise, and whether planned, under way or completed.

Financially, it does not look as though we will as much as break even, and this is sad, but money is not everything, and I simply have a deep faith that somehow, from somewhere, the financial position will be put right.

To highlight parts of this congress is an impossible task but I do feel that in having among us people like Magqubu Ntombela, and listening to Magqubu's viewpoint, as well as the stories that Martin Xase told us through Laurens van der Post, and in hearing the most moving paper by our Mohawk princess, a new dimension was introduced. Another point that particularly struck me was the remark by Chief Gatsha Buthelezi, that he believed the politicians of the world should periodically gather in the wilderness, for he felt that this was the way they would resolve their differences.

Ken Tinley said how important it was to take an holistic approach, that everything was part of the whole. When I drew up the original programme it was one of my aims to have speaker after speaker presenting parts of the whole, and I think this has been achieved and out of it has come a deep sense of understanding.

Finally may I say how proud I was of the audience and their tremendous patience in attending day after day. I know that some things went wrong: the p.a. system, the food, the hardness of the floor, the uncomfortable chairs, but despite all this people came and listened and somehow I feel it is the beginning of something new, that this congress is like the planting of a tree which will grow into something as mighty as the redwoods of California.

Discussions

First Discussion Monday 24th October 1977

D.P. Ackerman, South Africa

I think everybody here is aware of the fact that for an Arizona cattle ranch in the United States to be a viable economic proposition it must be many times the area of a dairy farm in Wisconsin. In South Africa that, of course, is due to differences in rainfall. In South Africa we have basically a very large semi-arid to arid interior, with a much smaller area along the eastern southern coast which is well watered. While I fully endorse Mr Arnett's views about not bringing politics into this discussion, I wish to raise one point: if you look at the map of South Africa showing rainfall and you were to superimpose a map showing the black homelands, you will find that with the single exception of Bophuthatswana, these are located in the higher rainfall parts of the country. I mention this because, although Chief Buthelezi put his case very clearly, I think his statistics about population as against area were slightly irrelevant.

Chief Buthelezi, KwaZulu

I cannot comprehend the speaker's emphasis that my statistics are irrelevant because in the first place where I come from the land that is available has not been exploited to the full by my people . . . and it is not because my people are generally described as lazy, because laziness is supposed to be something innate in blacks. It is because even whites themselves have to be educated in order to be able to deal with land properly. In this country my people are deprived of a free and compulsory education, and things are what they are in Soweto today because a wrong type of education is imposed on my people by those who are in power. So I don't see why the speaker should say that what I have said was irrelevant. Even if our land is in the high rainfall area, and even if we had the best agricultural methods, the population is too high to be accommodated. It cannot possibly be just and adequate that a population of black people comprising eighty per cent of the population of South Africa should have only those areas, whereas in fact we have developed the whole of South Africa together. It is white and black people of this country who have developed Johannesburg. So I cannot see for a moment why in fact I should be a foreigner in Johannesburg, because it is the sweat and brawn of my people as well as the white man's technology that has developed Johannesburg.

Ray Arnett, USA

If I understood you correctly, politics certainly does intervene and there is absolutely nothing we can do about it. I was in the political field for twelve years so I know how nosy I could be in an administrator's activities, because you have to look out for the people in your district that are looking out for your best interest too. So I wish it were that politics did not intervene in decisions of biological interest . . . if you were talking strictly about the wildlife game and the habitat. But we aren't. We are talking about people who have to be considered in all of these facets of wildlife and habitats, so with that in mind you cannot divorce political and biological fields. It's unfortunate but that's the truth.

Bruce Young, Canada

If this is in order, Dr McCrystal, I wonder whether Chief Buthelezi, who mentioned that his government would have a new department of conservation to look after the game reserves, could tell us how many veterinarians, how many trained personnel there are at the moment, or are being trained for those sort of positions when that department is formed?

Chief Buthelezi, KwaZulu

I think it was most unfortunate that when education was brought to this country for blacks, formal education was emphasized to the exclusion of technical education, because today there is not a single really technical college that is worth that name for blacks in South Africa, and even Fort Hare, which is the oldest university for blacks, instituted a faculty of veterinary science only a couple of years ago. Therefore, among the people we have in KwaZulu, we do have a few running our departments who are not blacks but who are seconded to us by Pretoria. Unfortunately, I cannot enlighten the questioner more than I have done . . . those are the bare facts of the situation.

Second Discussion Tuesday 25th October

1977

Rory Rieder, South Africa

Mr Ackerman mentioned two wilderness areas in the Cape Province. Could he elucidate and tell me where they are and their sizes?

D.P. Ackerman, South Africa

One is the Cedarberg, which I think is fairly well known to South Africans. It lies approximately due north of Cape Town, near Clanwilliam and Citrusdal, but the size I don't have in my mind at the moment. It is, I think, something like 170 000 to 180 000 hectares. The other area is a smaller one, not very far from Port Elizabeth, known as Groendaal. I think the size of that is more or less 100 000 hectares.

T. Riley, Swaziland

Would Dr Conway like to comment on the use of chimpanzees, as an endangered species, in heart transplantations.

Dr William G. Conway, United States

I am delighted to comment. I am very much against it. Unfortunately, there are not so many chimpanzees as there are human beings. Unfortunately even further, as you probably know, only a very small proportion of the chimpanzee population is of O type blood. Very few are suitable for consideration as donors for heart transplants at this stage in our understanding of immunology. Therefore I do not consider that heart transplants are a major threat to the chimpanzee population. Kidney transplants may be a more important threat at some time in the future. However, I can tell you that in the United States primate use is a very serious problem and is for the first time becoming restricted by the federal government. During the production of the peak years of polio-salk vaccine, 1958-1959 and 1960, 634 000 wild primates were imported and killed in the USA for the production of salk vaccine. Unfortunately, no chimpanzee populations anywhere on earth are properly managed. To utilize them for biomedical research and efforts such as heart transplants until they are managed simply seems self defeating.

Third Discussion Wednesday 26th October 1977

Mr Buckstead, South Africa

If the sea is regarded as a wilderness or part of the wilderness concept, my question will be relevant for John Geddes Page. I've worked in Zululand this year and I observed that at Sordwana Bay and other Parks Board resorts ski boats return daily with catches of fish absolutely unrestricted as far as size, species and total bag limits are concerned. I'd like to ask two questions: are there any restrictions and if there are, why are they not enforced?

John Geddes Page, South Africa

Before we were able to make sense of the shad ban we had to get the co-operation of the Sea Fisheries Branch. I must first give some historic background. Natal retained the control of its foreshore in 1910 at the time of Union, again at the time of the formation of the Republic, so that whereas it controls its foreshore and anybody standing on the shore throwing his sinker into the sea and fishing, it does not control what takes place from the ski boat. We rather hoped that we would be able to enforce our laws upon the ski boater as he landed. Unfortunately, the court has found that we cannot, that we are not legally competent to do so. The fishes being caught by ski boats should be controlled by the division of the Sea Fisheries Branch, and fortunately we have people like Dr Heydorn with us. He and his Oceanographic Research Institute are working hard at trying to establish parameters to enable us to demand the kind of control over other species that we've now got over shad, thanks to his assistance. But it does require that we, as the nature conservation authority for the province of Natal, get the co-operation of the Sea Fisheries Branch. And I do warn you that the Sea Fisheries Branch is part of the Department of Commerce and Industry. It has long been a real responsibility of that department to encourage the exploitation of the fishes of the sea. Obviously, we hope it will be done on a conservation basis, and if at any time we can show that there is a threat to any other species, as we were able to in the case of the shad, we would hope to effect the same controls.

Mr Nxgokho, Transkei

We have heard so much of the need for conservation and also gathered the idea of a civilization which has reached its climax. It would appear to me that when I get back to my people in the Transkei, one of my major duties is to "unteach" them the western ways of civilization. But I have a problem here, because my people have been told, and it was instilled into them, that the western ways of civilization are the best. Now how do I start unteaching them?

I think that in order to be successful at my job I need to be very, very practical and not theoretical. So it would not help me at all to theorise. I want to ask this organization why, for instance, do the whites not start to be practical about these issues and stop theorising? Why, for instance, not organize a campaign and go to the Prime Minister and ask him to stop hunting with a gun and use a spear? And then my people might perhaps listen quite easily to this sort of thing, because they will see that the western way of civilization which used to use a gun for shooting has now resorted to using a spear. Therefore they can also go back and use a spear.

Maurice Mackenzie, South Africa

You want something practical done. I can assure you everybody at this congress is right behind you. We will get something practical done as a result of this congress. There have probably never before been as many people with the same burning desire brought together on one subject as there are now in Johannesburg at this congress. If nothing flows from this, I will be a very surprised man: Those very issues you speak of are due to be handled in a practical manner. We know that theorising is wonderful around a campfire or with a bottle of wine, but we also know that theorising isn't the "D-O=DO" if I may quote Ian Player. You are like all of us, a part of the evolutionary system . . . which in Africa is of western civilization. There are thousands of people who are saying that western civilization is in the process of killing us, with our technological advance. If it is at all possible to leave the sphere of western civilization in southern Africa, I should like to find that way as well. We are caught in its web, we live in its web, yet at a congress such as this we try to create within that web the very situation we are seeking, which is to restore, maintain and conserve. Your nation has a lot to learn just as our nation has a lot to learn. If your nation needs help, it will get help. You will find that your mere presence here is going to result in a lot of information flowing your way.

Simon Xkomasa, South Africa

I am merely concerned or involved in conservation education. Mr Chairman, you mentioned that the minority of the population is dedicated to conservation. This to me seems to be quite true. Being involved in conservation education, I do at times hear frustrating remarks when I am with groups right in the bush. I am not trying to contradict what Mr Nxgokho said but this perhaps in a way ties up with what he has said. Some members or group participants do say the whites have taught us western ways of doing things. We have just become urbanized. Now they are taking us back to the bush. To me, that is very easy to answer. But the question that I always find difficult to answer . . . which is the question I am trying to direct to you . . . is: if they feel we must know as much as possible about what we are supposed to conserve in the wilderness, why don't they allow us to share with them in the enjoyment of these wilderness areas, in order to know that it is our responsibility to use them responsibly? I always find it difficult to answer this question, so my point is, could you perhaps suggest any other way of giving these people a positive answer that will whet their interest in conservation areas and make them think positively about the wild areas?

Maurice Mackenzie, South Africa

First of all, you must try to accept various facts. One of them is that the people you speak of live in the country of South Africa, under its existing governmental system. Secondly, we whites have evolved . . . we call it evolvement . . . you people out of your tribal societies into our society and in so doing, we have removed from you your natural appreciation of wilderness and your natural grasp of the wild. That small minority you spoke of is cognisant of the fact that we have done this to you. But there is a great need to re-educate those who have been westernised, because they no longer have the instinctive tribal appreciation of wilderness. You know yourself . . . and you've heard it over the several days here . . . that politics has no part in nature. Those of us who are connected with schools, educational programmes, wildlife societies, have no respect for any segregation, simply because whether Homo sapiens has a dark skin or white skin is immaterial. It is his brain we are trying to educate. In the

exposure to wilderness you will find that the African and his response is much the same as the European and his response. He becomes reborn.

Ian Player, South Africa

I take the last question very seriously, but I feel that if nothing else comes out of this congress there should be one point: that we have heard a Red Indian, we have heard people from Thailand, we have heard a full-blooded Australian Aborigine, and their various cultures. What we've got to learn is how to mix those cultures and take the best from them. Then, having taken the best from them, we can work towards a better tomorrow.

D.P. Ackerman, South Africa

Not a question, but a comment: John Geddes Page referred to the strict wilderness standards embodied in the Forest Act and whether these would not necessarily be applied in other areas. I agree with him entirely. I think in our population we have a very wide range of needs. People want to get out into the bush and don't all want to do it in the same way. I think facilities we provide for them should therefore also be wide. It may be a little bit confusing if everybody talks of a wilderness area when they mean different things by that term. We have complete wilderness, we have areas of some small amount of development, we have other areas with more intensive development. Perhaps one should sit down and think out a bit of terminology and possibly use terms like the American primitive areas for something that is not quite a wilderness.

Julia Mavimbela, Soweto

Firstly, I want to say a word of thanks to whoever sponsored the twelve children who came from Soweto. I just want to introduce them to this house with great pride and a feeling of contribution to this congress, which I've enjoyed from its beginning. Our twelve young men here are endeavouring to bring Soweto into what we call greener than it was green. And these young men have on their own proclaimed themselves to work voluntarily in Soweto by planting wherever possible. But these young men have a difficulty in that they haven't got the real tools. So my question will be: could you, via this congress, give us what we call a subsoiler for Soweto, to try and make up what we call food for ourselves? Already we have started by putting little gardens in Soweto and with the generosity of Johannesburg we have been able to get seed and other things to promote the standard of life in Soweto. And last but not least I also wish to ask: is it possible that, particularly at this time of suspense and vacuum in Soweto, our young men and girls can also be accepted in the school of wilderness?

Maurice Mackenzie, South Africa

The answer to the last question is, of course, yes, your children can be accepted on trail, and there is an easy way of applying. In fact there is an office of the school at the back end of the main hall. The first part of your request I am going to put to the audience. You've heard their need for a subsoiler and seed, which is not exactly the function of this congress. But I do feel that if anyone is moved to assist they must certainly do so. I would suggest the means of doing so be through the secretariat.

Sandy Whyte, South Africa

I would like to ask Dr Baker if he can tell us what the vital functions of a tree are.

Dr Baker, New Zealand

It's quite impossible to answer your question in a few words, but I would underscore the fact that the most important product of the forest is oxygen. I would give that as a primary product because we live less than 5 minutes without air. Next is water . . . we live less than 5 days without water, and we live less than 5 weeks without food. These are the first products . . . not timber, but air, water, food and then climate. Then, they absorb the impurities in the air. The more industrialised a country becomes the greater the tree-cover needed. The more populated the city becomes, the greater the lungs we need. The leaves of the trees are the lungs of the city, and a very important function is the raising of the water table in the ground. Trees also collect the minerals from underneath. They bring them up to the top of the leaves and when they have served their function of carbon assimilation, of wood formation, they fall back to earth and they are taken down by worms. And that gives just the right proportion of trace elements the country needs. But there are a whole lot of other things . . . these are just a few.

Edmund de Rothschild, Britain

Could I ask Dr Baker how dangerous is the cutting down of the trees in the Amazon basin?

Dr Baker, New Zealand

What is happening in the Amazon basin is very frightening. Some consortium in Wall Street or the city of London has given a concession to the Japanese to fell trees to make buffalo farms, to grow buffalo-beef farms. They are felling the high forests in the Amazon, boning the beef and putting it on high-flying planes . . . 38 000 ft . . . and by the time it gets to Tokyo it's frozen. This is having the effect of eating into the last best oxygen bank of the world, and the USA particularly is running short of oxygen. We see what is happening in Belfast; that is the worst treed country in Europe and the air is very polluted with lead. There has been a recent experiment putting rats into a box and then pumping into the box the air from the streets of Belfast. The rats all start to fight each other. If we haven't enough oxygen, we shall all start to fight each other.

Edmund de Rothschild, Britain

It is the Brazilians who have given the concession, and it is to the Brazilians that we must make the necessary noises about the oxygen bank that exists for our own use.

Howard Kirk

I'd like to ask Dr Heydorn about the reaping of plankton krill and what effect this will have on the world population of whales. We understand that the whales themselves are no longer terribly endangered, but will the intensive reaping of their food supply affect them?

Dr Heydorn, South Africa

This is a justified question, but I am optimistic that mankind is learning. While the whale industry developed progressively and haphazardly and with little contact, there is now at the present moment an immense scientific programme being planned called "Biomass". It is a programme in the southern oceans in which the physical and biological interaction of all levels of the food web are to be studied. Krill, of course,

forms a very particular part in this particular study because it happens to be a very noticeable and a very dense level in the food web. The whole international programme was planned at various meetings . . . a meeting of experts at Wood's Hole, a joint oceanographic assembly at Edinburgh last year and it is now being taken further by national committees. Last week in Pretoria there was a meeting in which these proposals were also discussed by the South African National Committee for Oceanographic Research. If krill were to be used indiscriminately, harvested indiscriminately, I think there might be effects. But harvesting will be monitored internationally and furthermore, at this stage there is not such a tremendous outlet for krill because while whalemeat is a product which can be used as it is, human beings have to be taught to use krill products. Some nations are further advanced in this respect than others, for example Japan. I do think there is a danger, but that danger is being recognized and it will therefore be countered by monitoring.

Ian Player, South Africa

I'd like to ask Dr Heydorn another question. I am a fisherman, a sports fisherman, and I live in Natal. I'd like to know whether the coastline of Natal can be saved, whether fishing can be brought back, because of the erosion that has taken place and the building of bridges and the estuaries and everything else that has been done to that coastline. Is there any hope for it, or do we just write it off?

Dr Heydorn, South Africa

It's a good question and I understand exactly why it's being asked. The point is that what we are learning now we should really have learned 10 or 20 years ago. Furthermore, if the communications which are being established now between people in various disciplines not only between scientists amongst themselves, but between people in every level of development and in every facet of industry and agriculture, had taken place 10 or 20 years ago, then we wouldn't have the problems which we have at the present moment. My answer is that under no circumstances should we adopt an attitude that everything is lost. Rather, we should work progressively to try and restore as far as this is possible. The biggest ally in this, I believe, is nature itself with its tremendous resilience. We saw the St Lucia system bounce back into ecological viability when the rains came. And work, for example in St Lucia, is going on now in diverting water via a channel in the Umfolozi River back into the system, so when the floods come down and the water is so full of silt, that water can still go to the sea. What is necessary, in particular, is not antagonistic but positive contact between the agricultural industry and organisations such as the Natal Parks Board, the Sea Fisheries Branch and ourselves (Association for Marine Biological Research) because this relationship between agriculture and the nature of our estuaries and of the sea was simply not understood. I think it is beginning to be understood that a viable economy cannot be built upon a damaged environment and furthermore, it doesn't help to develop one facet of the economy at the expense of another. Therefore, if for example, the sugar industry is developed or if this agriculture is developed at the expense of the fishing industry or the tourist industry, then the benefit to the country is A-B+C. I think that this contact is being made. I would like to make one other point. Mr Nxgokho of the Transkei made a rather wry comment this morning. In fact, the Transkeian Government is going about matters of development of their coastline in a most admirable fashion, but in such a way that people . . . the black people of the Transkei and the white people who made the mistake in Natal . . . are working positively together to try to avoid the mistakes which were made in Natal. I say this with a little bit of wryness myself because I did hear that the Nxoksana estuary area was earmarked for harbour development. But I am sure that further developmental discussion will take place. Under no circumstances would I say all is lost, and never may we

stop working to improve matters. We've got the ability and we've got the resilience of nature on our side.

Sandy Whyte, South Africa

It's been said by Dr Acocks that our country is drying up at an alarmingly fast rate. In fact one of the attorneys I know in Newcastle has told me he has found plants of the Karoo the other side of Colenso on the way to Durban. I am told that the two countries going most rapidly towards desert are India and South Africa. In his opinion does he think that it is possible to stem this by planting trees as he is doing in the Sahara?

Dr Baker, New Zealand

Really, I am not in a position to answer that question. I don't know enough of your local conditions. Sahara is entirely different but in turn I would like to ask a question myself. I would like to say thank you to Donald Morris for the very stimulating paper and to ask him to repeat the number of newspapers that he said were being published in the United States. The other part of the question: does he know that one metropolitan edition of the *New York Times* needs 133,65 hectares every time it is printed every Sunday? And does he know that newsprint takes only thirteen per cent of the paper pulp used, that thirty per cent goes into wrapping paper and bags, because we can't trust each other to buy the stuff and to put it into a shopping bag?

Verne McLaren, Australia

We have heard a great deal about the management of parks. I would like to know if you have a buffer zone in your national parks and reserves in Africa, to combat disease for instance. In Australia we are very concerned about the introduction of foot and mouth disease. I would like to know what is happening or what has happened in this country to combat various diseases?

Mr Young, South Africa

Foot and mouth disease is one of the diseases occurring in the Eastern Transvaal which presents problems to our domestic livestock. We are not all that much concerned about foot and mouth disease in wildlife, except if we are exporting products from the Kruger Park or from any other part of the Republic. We are, however, concerned about anthrax, rinderpest and other diseases which can eradicate wildlife in this country. There is not much done at this stage except for research work by Onderstepoort and various nature conservation departments and the veterinary department. During the last few years we have seen the development of vaccination techniques or parasite treatment techniques which never before existed. It is now possible in theory at least to vaccinate up to a few hundred animals at a time. Vaccines are available and most of these vaccines have been tested out. I think we are quite well prepared for the control of infectious diseases on a large scale. I am not talking about the dramatic diseases.

Then, on a smaller scale, game farming has become the "in" thing in South Africa. There are more than 3 000 game farms in the Transvaal already which are productive, and which are to some extent used for commercial purposes. Game farming and these problems are also at this moment receiving a lot of attention, not only from ecologists, but also from vets, and a lot of research work has been done to try to combat diseases which are transferable from domestic animals to wild animals or may naturally affect these wild animals. I may just mention that it's more of a problem than you may realize . . . in buffalo alone more than forty-four different diseases and parasites

have so far been identified. To give you some indication of what is being done . . . bearing in mind that this is very artificial, this is not wilderness but game farming. It's commercial, and it's already an accepted fact that if you do transport animals you vaccinate them, you treat them, too, against whatever you can to make sure that you don't transfer infections from one infected area to another cleaner area. They have also gone so far as to provide licks with trace elements to feed these animals to create a better or more resistant population, and at the same time also include things like wormicides for the treatment of internal parasites etc. In other words, what they are doing for domestic animals in this country they can do for wild animals, and they try to do it on a small scale on the game farms. One can talk for hours, but I hope this gives you some indication that we are trying to do something to save these animals.

John Wallace

My family is a very typical one. We take the daily newspaper and the weekly newspaper and at the end of the week, when clearing out the week's takings, I am always horrified by the sheer bulk of the newsprint involved. In a world of increasing population and diminishing resources, the thought has occurred to me . . . as I am sure it has occurred to many people . . . that it's absolutely vital that we re-examine many of the norms which we accept today without question. I wonder whether in the year 2000, when our population has doubled, or when it is predicted to have doubled, we will still all be taking a daily newspaper in the manner in which we do now? Are there any trends towards less consumptive use of timber for this purpose in the future?

Dr Baker, New Zealand

I should just like to underscore what the last questioner said, because I know from first-hand experience that Canada is being skinned alive for paper pulp. The answer is that the earth can stand this if it has enough trees, and we don't mind their being used for paper pulp so long as we have sufficient numbers coming on. This is a legitimate use for timber, but the other uses I mentioned just now are much more important. The great thing is to maintain the minimum tree-cover of thirty three and one third per cent, but surely the essential news can be condensed on a couple of pages or a single page? The last time I weighed a *New York Times* Sunday edition it was 3,6 kg. I took it under my arm, out of my load, otherwise I might have been charged for excess baggage in New York!

Fourth Discussion Thursday 27th October 1977

John Lister-Kaye, Scotland

If I may, I would like to make a comment. I came here as a dispassionate observer, content to sit and to learn, but the volume of experience and feeling that is being put over here has made me no longer content and no longer dispassionate. I would like to put a British point to this congress. Britain has despoiled more areas of wilderness than any other nation in the world. I am not being unpatriotic. I am very, very fond of my country. But at home we have a very serious problem: we have no true wilderness left and we have very little countryside. We have 20,3 million hectares of land and nearly sixty million people. We have experienced pressures in Britain of which you will have no idea of here yet. We've realised too late that the only way to solve these problems is through education of children, education of the young, and my heart leaped to hear Sue Hart speak the other day, and when Dr Hanks spoke this morning about completely altering our programme of education. I knew very fully what he meant. How can this be done? Ian Player very correctly said that there were two sorts of people here. There were thinkers and there were doers, and I would like to venture to suggest that there is a third category to which I certainly belong . . . and that is catalysts. It is vital that Iain Douglas-Hamilton goes on counting elephants. It is vital that we have governors of American states such as we have heard, and these people are intimately involved in conservation. But for the rest of us it is very difficult to know how we can really get to grips with this subject.

I would like to venture a suggestion of how we can do it. Let no man leave this congress without a very clear idea of how he can go back into the world and help conservation, otherwise our time here is wasted. Conservation must become a religion and I hate quotations out of context, but if ever there was one that was appropriate from the Bible, it is: "Remember now thy Creator in the days of thy youth, while the evil days come not, nor the years draw nigh, when thou shall say, 'I have no pleasure in them.'" I would venture to suggest that the code we can use in our homes for education of our children, and of people we meet in a daily experience on pavements and in shops, can be listed simply and biblically with three convenient and well known pegs. One is faith; you've got to have implicit faith in conservation. You've got to have hope, because without hope there is no life; you've got to have a towering hope, that the Iain Douglas-Hamiltons and the governors of Alaska can do something for conservation and for wilderness. And you've got to provide them with public support, because it is public opinion in the final analysis that will save wilderness, make no mistake of that. The weight of public opinion can be altered only by child education beginning at the very bottom . . . primary, secondary and tertiary.

At this point the speaker was reminded that his speech was out of order during the discussion period, but after a spontaneous burst of applause from the audience he was allowed to continue.

We've talked about faith and hope and of course the third one is charity. Charity I interpret as sharing, and I consider it vital that we go out and not only share our experiences in wilderness, of course that is vital, but that from the very bottom of our hearts and the very base of our interests we share a respect for the land and this must include the window-box and the back garden, the town park and the rigger field, as well as the great wilderness areas. We've got twenty years perhaps. If we can bring up a generation which understands and appreciates land-respect from birth as an in-

stilled standard of conduct, which is how we all live . . . we don't spit at our mothers or break wind at the breakfast table, because these are instilled standards of conduct. If we make it certain that all young people respect the land, then we have some chance of conserving. So that charity must be a charity of spirit; it must be giving and sharing the whole time, to persuade people who cannot enjoy the great outside that there is a very real thing behind this. Now, just in case anyone thinks I am another pious Englishman dictating morals to South Africa and to the rest of the world, I am not. Let's get my credentials right. My great-grandfather shot Mohawk Indians and made more money out of ivory and the slave trade from the west coast of Africa than it takes to make Edmund de Rothschild sit up and think. After 850 years of land-holding in Britain, the British Empire caused a lot of trouble. I stiffened in my chair when Lord Glynisco came on the film shown last night of tigers, and I am very grateful that some of the other guns in that party were not named personally. My wife is the daughter of a great Anglo-Dutch house who sheltered the Kaiser, the one man who is responsible for causing more deaths than any other person in human history. They wrote a book about it. It is not out of arrogance that we've come here to preach morals . . . it's out of guilt and it's a very deep basic desire to try to do something about it.

" . . . Charity suffereth long, and is kind; charity envieth not; charity vaunteth not itself, is not puffed up . . . Charity never faileth . . ." and it doesn't take me to tell you people here to listen and to harken to the pure philosophy of your own Afrikaner soldier, your forgiving warrior, Van der Post, who is voluntarily exiled from our modern world by the crushing logic of his own spontaneous charity. "And now abideth faith, hope and charity, these three . . . and the greatest of these is charity."

Sandy Whyte, South Africa

I direct this at Dr John Hanks. I don't know if he is aware of the book *Bread for the World* by Arthur Simon. It refers to the population problem and indicates that the main problem, which has been proved in one country in particular, is not propaganda against population increase in favour of birth control, but the need to improve the life of people so they can appreciate that there is a reason to preserve nature for a better life. The reference here is to South Korea and Taiwan, where it wasn't until the quality of life of people was improved that the population statistics were affected. It was apparently unaffected by propaganda.

Dr John Hanks, South Africa

I don't know the references, but I do agree with what you say, that it would be wrong to promote a population policy in isolation without at the same time trying to increase the standards of living of people throughout the world and within each racial group. Just to give you one more statistic, the one country that has pushed family planning on its own in isolation, without perhaps trying to increase the standard of living or without tying this to a population policy, is India. India started doing this 25 years ago, and the population grew by 3,6 million. Last year, after this all-out effort of pushing family planning on its own without trying to raise the standard of living in many places, the population grew by 16,2 million. I think that answers your question.

Eric Franck, South Africa

To those who know something of the Bushmen, it is well known that certain of them, possibly not all, have that in-built ability to talk better than a civilized white man, without a radio, over vast distances of the desert. Is it perhaps possible that Martin has something to say on this?

Martin Xase

They are a group of people not like in other countries, all living together and very fond of nature. Here with us it is very different. One sees that conditions are completely different. They used to resort to throwing the bones, which were divining objects. The old people could do this, and so one part of the country knew what was happening in another. They are not able to do this anymore.

Lyn Hurry

I have just finished a survey for the Wildlife Society of South Africa, talking to inspectors of education throughout the country in the environmental subjects. The impression I've gained in regard to conservation awareness is that most people, and certainly those at the top, see conservation awareness as the responsibility of particular subjects, such as biology and geography. Conservation awareness obviously must be taught at all levels and through all subjects at school, and it shouldn't be an individualized thing. Conservation awareness ethics should be introduced as across-the-board education policy. This is not done, but is terribly fragmented in terms of subjects individually. What I would like this congress to think about suggesting ... in South African contexts especially ... is that we have a policy from our education department on conservation awareness.

Sandy Whyte, South Africa

I would like to ask Ellis Monks to comment on this. There has recently appeared a report in the newspaper of the South African Council for Conservation and Anti-Pollution to the effect that hunting has been outlawed in Kenya. I got this paper only a few days ago. Now, from what he said, it appeared that this report was incorrect. I think it was datelined from the Sierra Club.

Ellis T Monks, Kenya

The report that hunting has been banned in Kenya is quite correct. The whole question of hunting and the trophy trade has engaged the attention of very many people for a long time. The ban placed on hunting has been criticized by many people. It's been regarded as detrimental to Kenya, as the green light for poaching. In many ways this is probably true, but the initial idea was that the whole of the illegal trade in trophies had to be brought under control. The only way this could be done was initially to ban hunting and thereby make all hunting illegal. From that point on, you could go into the shops and you could check on the trophy trade. World Wildlife Fund was given to understand that this was to be the procedure and we accordingly supported the hunting ban as a means of controlling the trade in game trophies. So far the follow-up to the hunting ban has not taken place. We are informed that this is in hand and that there will be an investigation into the illicit dealer in the field. But in the meantime, we feel that the reason which has been given for the hunting ban is incorrect. The reason given is that it will give the wildlife in Kenya time to regenerate. This is nonsense, because the number of animals that are taken by the hunting fraternity is, proportionate to the number of animals that are killed, relatively small. Don't for one moment think that I am supporting hunting. I am merely putting it in its correct perspective. For instance, Peter Beard, in his book *The End of the Game*, gave a figure in 1965 I believe it was, of 300 000 herd of game poached as against 10 000 animals which were taken by legal hunting. The last time licenses were issued for elephants, there were 707 licenses as against 12 000 elephants which were taken mainly by poachers. This could be repeated endlessly. It is nonsense to say that the hunters are responsible for depletion of game in East Africa. They have taken some, certainly, but

the bulk of the game is taken by the poachers. It is through the trophy trade and the illicit dealers. And we would like the tourist organisations who are asking their tourists to come to this country, not to buy anything made of game trophies ... elephant hair bracelets, ivory bangles, all the knick-knacks that go with it. These we need not buy. It is merely supporting the poaching and the game trophy trade which we are trying to ban.

Ian Player, South Africa

I'd like to ask Mr Tinley whether anything has happened to make him change his mind about the paper he presented to SARRCUS in Gorongosa some years ago. If I remember correctly, he gave me illustrations of how the people who are actually in charge of the parks are some of the biggest destroyers of the parks.

Ken Tinley, South Africa

I think that was fairly adequately covered in all these educational blinds that we have: that it's not seeing the wood for the trees or the lions for the elephants or the nick point for the drought. In other words, a lot of these things are done with the best of intentions, and these best of intentions are like bulldozers. Where a vlei system, for example, is cut into or where it becomes extinct but leaves its impression on the landscape, such areas are invaded by savannah. That kind of thing is not even taken into consideration, as far as I know, south of at least Lake Tanganyika; maybe, in East Africa, there are people who are playing around with the geomorphic dynamics of landscape surfaces. But certainly south of that what we do is to crop one animal and we haven't the faintest idea, we can't even imagine, what other kind of cycle we are imposing on the interrelations of the species, when we don't even know what they are being controlled from underneath. So we have a managerial problem where the people who are the custodians of all these places with the best of intentions are in fact the greatest enemies of wilderness, because we are all compartmentalized. It is not possible to decide what the salient factor is, and that is why education is a two-edged sword. The people who are caring for such wild places are as bad as the guys who come in there with bulldozers because one is subtle, one is overt, but the end results can be similar. So we are cropping one kind of animal. For example, just a very small example, in the flood plane system. That lake alone houses 3 000 hippos which are all short grass feeders. There were about 14 000 buffalo in Gorongosa at the last count; they are medium to tall grass feeders. Now along comes our friend, the wildebeest, who is also a short grass feeder. You can't tell me that there is not opportunism of the wildebeest population using what the hippos are keeping down. There surely is. So we crop hippo and we don't plug that nick point site in the landscape. We just take the hippo away, the grass gets longer, the wildebeest cannot handle long grass, it is physically impossible for them to handle the stuff, so you will have an explosion of buffalo and an extinction, or tendency to extinction, of wildebeest. Everything is related in this way. So we are playing around with the result, not getting down to the factors controlling this change, and that's why the size of wilderness areas is fundamental. If it's as big as this room, it will have one vlei. If that one vlei becomes extinct, hippo, lilies – everything that is water-dependent – will become extinct as a natural process in the landscape. But if it's bigger, while this is going extinct, what's cut off here by erosion is deposited somewhere else ahead, hopefully not as far as the Indian Ocean. So you have a cut and fill process.

There is room for these landscape processes. By plugging the Gorongosa system you are not stopping anything ... it's impossible to stop it. You damp processes in the landscape. So from the managerial point of view, or for being custodians of wilderness and wild places, the dilemma of decision is: do you leave landscape to go through its whole evolutionary process or do you damp it, to maintain the diversity

or to maintain a particular spectrum or species of animal? And this is where we come back to that problem in Khartoum.

Graham Child, Rhodesia

I am one of those unfortunate individuals who is entrusted with this decision-making process between blinkers. Whereas I agree with a tremendous amount of what Ken Tinley has said, I also think that he wasn't entirely correct. I believe that management has evolved rapidly in the last 4 or 5 years. Included in the decision-making process has certainly, in one little part of Africa, been a tremendous influence by Ken Tinley. He did say earlier that nobody is plugging any gaps anywhere. We have been doing so now for 4 years. Whether we are achieving anything, or whether we are proving Ken correct in this particular instance is difficult to tell, because we're up against mechanical problems of the types of soils we are dealing with, under the situation where there are critical base levels being cut through. But I did feel as one of the establishment ... and the establishment got a bit of a rocket here, quite rightly in many cases ... I did feel that I should stick up my hand and defend the establishment which is under different kinds of pressure as well as the ones that Ken Tinley referred to earlier.

Fifth Discussion Friday 28th October 1977

Lewis Regenstein, United States

I would like to start by saying that I agreed with what Mr Tennison said about the elephant situation in Kenya. But to a lot of people it is easy to understand how an African or villager could kill an elephant for its tusks to feed his family, or to amass a fortune. I think what is hard to understand is why an American so-called sportsman would want to come to Africa to shoot an elephant for the fun of it, to make himself feel like a man, or to put a big trophy on his wall to try to impress his friends. I spend much of my time in Washington D.C. working to try to counter the activities of the big-game trophy hunting outfits that we've heard so much about today, and about their conservation outfits. We spend a lot of our time trying to counter their attempts to weaken the U.S. Endangered Species Act, specifically to have the leopard and other imperilled animals taken off the endangered list. Mr Tennison mentioned that the trophy hunters had been instrumental in having the spotted cats . . . the leopard, the jaguar, the cheetah and other animals . . . put on the U.S. endangered list. I was very much involved in that fight and I can tell you that that is simply untrue.

Originally, there were some trophy hunters who wanted to have the cats put onto the list to ban the import of furs, because the U.S. fur industry was importing massive numbers of spotted cats' pelts from Africa, Asia and Latin America. But when the trophy hunting lobby realized that listing these animals on the U.S. list would also ban the import of trophies, they became very active in opposing it, and in fact held it up for quite some time, which allowed a lot more imports to be made, both of trophies and of furs. The situation was finally resolved when the Interior Department agreed to go ahead and list the animals with the proviso that trophies could be imported for up to one year after the listing under the economic hardship provision of the Act, and that there would be an attempt made to change the law to allow the import of legally taken trophies. During that one-year period, records that I have examined at the Interior Department indicate that 236 leopards were imported into this country during that period . . . so much for the trophy hunters' activities in conserving leopards!

I would also like to comment on some of the things we've heard about the great job which Safari Club International is doing. I recently received a brochure from Safari Club International advertising a jaguar hunt in South America. (A jaguar is a critically endangered species.) Safari Club is also very active in trying to have certain trophy animals taken off the U.S. endangered list. I think we all know that it is tourism which pays for the conservation of African wildlife, not trophy hunting. Mr Tennison's statement that the legal American hunter has never caused animals to be lost or endangered is actually laughable, and every time I see one of these hunting brochures, I see these big-game trophy hunters sitting in their rooms with trophies all over the room, and they usually have several cheetahs there. The cheetah is critically endangered and hunters, along with the fur industry, have contributed to bringing the cheetah to the point of near extinction.

Mr Tennison portrays anti-hunters as buying leopard skin purses, wearing leopard skin coats, buying ivory. I've been in the conservation movement and the so-called anti-hunting movement for many years and I don't know a single person who does this kind of thing, and I think it's really a slur on a lot of people who work very, very hard to conserve the very animals that you will go out and shoot. Let me sum up by saying that there is no basis for Mr Tennison's suggestion, that the Bible gives us

the animals to use, to kill, for the fun of hunters. He indicated that people hate him because they cannot hunt. I think these statements are really ridiculous. I was surprised and disappointed to see people at a conservation conference applauding such absurd statements. Mr Tennison stated that the outdoors is a cathedral where he worships, and I would like to express a hope that next time you are in your cathedral praying, Mr Tennison, you ask forgiveness for the many animals you have subjected to slaughter and suffering just to satisfy your own lust to kill.

May I make one more statement about American conservation and hunting, because I think we've had a lot of discussion today from hunters. We haven't had anybody get up and give a speech against hunting and talking about what hunting is doing to Africa and to America. I'd like to make one final statement on the hunting situation in America, to sum up by saying that none of the other speakers really gave a talk on this. I think it is really important to point out that a growing number of Americans and a growing number of people all over the world are becoming more and more opposed to what we call sport hunting. If it were not for the enormous amount of cruelty and killing involved in hunting, I think it would be comical to hear hunters discuss their sport as the exciting contest between hunter and prey that we hear so much about. We know that most of these game animals, as you call them, are harmless to man. They seldom have anything near a chance to escape, much less fight back, and there is an increasing number of people asking what sport there is in a grown man sneaking around the woods or the bush trying to shoot a doe or a fawn or a kudu or an impala . . . or any other creature unfortunate enough to encounter a sportsman during the hunting season.

Harry Tennison, United States

The answer to the jaguar situation: when I saw that that hunt was advertised, Game Coin went on record immediately with a wire and a very strong letter and a telephone call of protest. We are now financing a jaguar study. I called the people in Mexico City and strenuously objected. I talked to the president of that organisation you mentioned. I said, "What else can you do to harm hunters?"

You said something about the cheetah. There are too many cheetahs in South West Africa right now. They are endangering the crops there, of game and other things. They have to be controlled. Now this is from a rancher in South West Africa, whom I talked to today. Maybe not in all places, but certainly they are not endangered. The rancher wanted to ship some of them out, and re-locate them in several places to try to see them put in some place similar to what they have done in Zululand, which is a wonderful job, and I'm glad to say I had a hand in re-locating those animals. As far as the Bible goes, I don't want to argue about a word. I don't know how much time you've spent in the outdoors. I don't know where you've ever hunted. From reading your books, I don't believe that you have experienced the wilderness at all.

Kate Michell, Australia

I would like to ask Wally O'Grady what percentage of the leasehold of Cape York peninsula is owned by Americans and others than Australians. Would you know?

Wally O'Grady, Australia

A little over fifty per cent is owned by Americans, and altogether foreign ownership would be something over sixty per cent.

Godfrey Dunkley, South Africa

Professor Whitney spoke of a bill of rights for wild animals and for wilderness. The American Bill of Rights and various others we know have resulted in people demanding rights, and everybody leaves it to somebody else to see to their rights. I suggest that you flip the coin and write up a bill of duties, applicable from the president down to the lowest man in the land.

Dr William G. Conway, United States

Several speakers have stated that the congress must find its objectives, and among those objectives should be a definition of wilderness which has been represented in several different ways. I would like to make the comment that the maintenance of original ecosystems of native wildlife communities should be the concern of a wilderness congress. The wilderness experience must not be equated with having something to shoot, and if it is our objective to support the introduction of European deer and Asiatic goats in New Zealand or wallabies in Great Britain or Barbary sheep in New Mexico, this congress must change its name or it will end in confusion. So I would hope that we would consider that some of these items, which have been discussed in the context of wilderness, are really inappropriate to our deliberations here.

Harold Cooper, Lesotho

A short time ago Mrs Cooper and I had the very distinct pleasure of hearing three or four elderly ladies express their awe and amazement at a panorama that expanded beyond them almost endlessly. One of the ladies had to be helped by the other two to get around. They were on the top of one of the higher peaks in Switzerland. They couldn't have got there except by means of the Kog railroad. There are thousands, perhaps even millions, of people who have spent their lives bringing up their families, paying off mortgages and now have perhaps a little time to re-touch nature and to again touch base with their maker. I am wondering if it is possible to recognize that here and there a little piece of wilderness might be developed for the aged, the crippled and for the people who perhaps are most in need of this kind of experience and perhaps are more deserving in some respects, and prepare this piece of wilderness for the use, not exclusively for these people, but for their benefit.

Geenyard Daloram

I have a straightforward bookkeeping question for Professor Whitney. When polluted air and polluted water are cleaned up by various means, then only are they reflected in the D and P figures. How is a land put away for wilderness accounted for in whatever national bookkeeping is being kept?

Professor Scott C. Whitney, United States

Well, I hope I have understood your question. The figures of private sector costs for five environmental clean-up programmes, two of which are air and water, are on the order of \$260 billion and that in 1975 was simply a compilation based on the specific co-operation and point sources and activities including public, for your own treatment and things of that sort, multiplied through by the anticipated cost of the equipment needed. The environmental cost represented by a wilderness set aside is not susceptible to the same kind of precise qualification. It necessarily involves estimates about quantities of resources available in these areas . . . estimates of how much oil and gas, how much coal, timber, grazing potential and so on, and what it would

fetch. One of the difficult aspects of this kind of cost-benefit analysis is that it is quite an inexact science, and what we are dealing with are best-effort forecastings.

Wendy Bodman, South Africa

My question is directed to Mr O'Grady. He mentioned the mining activities of bauxite and silica. I would like to ask him what limits are placed on the spread of mining activities in the Cape York peninsula, and does mining legislation in that area permit exploitation of mineral finds from a prospecting licence? Because this happens in South Africa; you basically need a prospecting licence, and then if you find what you are looking for a mining licence follows automatically. I fear for the future of any area that produces such a nice picture of silica dunes as occurs on the brochure. So the question is mainly, what are the limits on mining activities?

Wally O'Grady, Australia

The first part of the question about the procedure on prospecting licences and then the other licence following automatically . . . very often that does happen in Queensland, but since more pressure has been brought to bear on these things they go before a warden's court in which they can be contested. I don't know the full story about this, perhaps my colleague, Percy Trezise, may know more about it. There is one point about the mining of silica sands I would like you to remember. There are at White Point beautiful silica sands as yet untouched. There are some mining leases there but if we get support from this congress, we will be in a stronger position to stop those areas, because we will say to the Queensland government, "Now look, you have got all those millions of tons of Cape Flattery, surely it won't scrape the bottom of the barrel dry? Let us keep the silica sands as White Point." But don't forget that in all these things in Cape York that we are trying to save your support will help us.

Percy Trezise, Australia

In addition to what Wally O'Grady had to say about the mining in Cape York, the mineral areas are now very defined. The whole place has been exhaustively prospected from the air and from the ground, and it appears that there is only a relatively small strip of bauxite on the western coast and immense deposits of silica sand on the east coast. I think we can contain the mining to a small area, because there is such a tremendous amount of the silica sands, which can supply the world for quite a number of years without making a significant impact on the area.

Boet Dannhauser, South Africa

I am a professional hunter and I am proud of it. I firstly want to back up Harry Tension for what he has done in the past for the wildlife and I want this congress to put on record that it is high time that people realised that wildlife has to compete against industry, farming . . . cattle farming and agricultural. There are no ways I know of that game can compete if it is not done through professional safaris, and properly catered for. Here in the Northern Transvaal there are farmers being sued by neighbour farmers (I'm talking about game ranch farms) because they are game ranchers. They are being accused of carrying tick-borne diseases. The problem is the ticks. These farmers are ten to one going to lose the court case, and what are we game conservationists doing about it? Are we backing the game rancher? Are we going out further, as with the leopard? With the complete banning of the leopard, there are farmers here who are shooting and poisoning their leopard right now, because the leopard has no value for them at all. If it had a value on a safari basis, that farmer would let the leopard kill

a few calves or kill a few impala and he would keep that leopard and it could then continue to breed. But with the structure as it is now the leopard has no value and it is being wiped out. The same with the cheetah. There is a complete ban on the cheetah . . . the farmer, why should he keep it? The only way we are going to keep these species is to encourage the farmer and produce a market for him.

Mr Ntlaba, Transkei

I would like to ask Professor Whitney . . . accepting that the problem of conservation is a multi-disciplinary one and that operating from a government position it then becomes an inter-departmental one – what is the best approach to achieve a proper and functional legal machinery for conservation, without necessarily infringing the rights of another department?

Professor Scott C. Whitney, United States

One of our bigger problems in the United States as to environmental reform and including wilderness matters, is the fact that there has been such enthusiasm in our legislature to enact protective measures and creative measures, that we have overlaps, redundancies and conflicts. So far as the United States is concerned, wilderness set-aside can occur in a number of different ways. The big one I mentioned this morning in my principal address had to do with a 46,69 million hectares in Alaska. That would never have come to pass and would not even be regarded as a possibility had it not been for the Alaskan Native Claims Settlement Act, which was motivated primarily, not by wilderness concern, but by a concern to make a reparations settlement to the indigenous peoples of Alaska, not just the Eskimos, but the Tringets and the Yakatats and so forth. And in the course of that legislation the so-called D2 lands, which comes from Provision 17 D2, addressed the question of what to do with those federal lands which were not transferred to the indigenous people. There is presently pending the Alaskan National Lands Settlement Act which must be concluded before December 28 1978, which addresses this problem, which would never have come up had it not been for this indigenous settlement. So that is one way that wilderness set-aside has become a possibility.

Another way is through executive direction, the President telling one or another department to assign specified federal lands to several of any wilderness-type categories available under those two earlier statutes I mentioned, the National Wilderness Preservations Systems Act and the Scenic Rivers Act, and that can implicate at least two agencies . . . the agricultural department handling the national forests and the interior department handling the national parks, and also a subdivision of the Department of Interior called the Bureau of Land Management, which has also been directed by executive order to examine 4,87 or 5,28 million hectares to consider carving these out of otherwise assigned national park, national forest or BLM lands for the much more stringent uses in terms of human presence. You can have a national park, for example, in which you've got literally millions of people going into it and quite large physical establishment of hotels and those kinds of facilities which are not true wilderness. When you cut a piece out, then for that enclave of land it must meet the wilderness criteria. So there you have those three additional possibilities of re-allocation of semi-protected lands that are given more stringent protection.

Finally, there is the possibility of a straight congressional initiative which by legislation will designate certain lands that may have been for example regarded as surplus for military use, or surplus for resource reserve use, and the Congress can designate those for wilderness purposes. So you do have a multi-agency possibility. I think the ones I've enumerated are the chief ones. There are probably other possibilities, but they would be minor by comparison.

John Fowkes, South Africa

One of the things which has pervaded this conference has been the need for environmental education. The attitude consistently put forward is that in fact it doesn't exist, and I think this should be corrected. A great deal of work has been done and is being done, and the resources are available not only in this country, but also in East Africa and elsewhere. I think one of the best things this conference can do is to channel these resources.

Ian Player spent his early childhood in the Transvaal and later settled in Natal. In 1952 he became a relief ranger for the Natal Parks Board and in 1955 directed anti-poaching operations in the Umfolozi Game Reserve. After a long administrative battle he succeeded in having this area proclaimed South Africa's first wilderness area. He founded the Wilderness Leadership School which organises walking trails for small groups of people all over South Africa. Trails have also been conducted in Rhodesia, Mozambique and Botswana. In 1974 he left the Natal Parks Board and joined the International Wilderness Leadership Foundation.

I went to the woods because
I wished to live deliberately,
to front only the essential
facts of life, and see if I
could not learn what it had
to teach, and not, when I
came to die, discover that I
had not lived.

Henry David Thoreau,
*Walden, 2, Where I Lived
and What I Lived For*