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NATURE CONSERVATION ?

An Inaugural Lecture
delivered at University College, Ibadan
on 17 May 1962.

by
NIELS BOLWIG, D.SC. (COPENHAGEN)
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by

Niels Bolwig

Europeans coming to Africa are frequently accused of being sentimental about the wild life. True enough, many of us are. I do not wish to deny that I am sentimental myself. I do not wish to deny that I love the African nature—that it was my love for nature which drove me to Africa—and that this love has up till now bound me to the continent for more than one and a half decades. It is this love which has made me take up the fight for the preservation of some of the unspoiled nature which still exists. I have come to love Africa, her people, her problems and her nature, but that does not necessarily mean that I have lost a sense of reality.

Man is dependent on nature as the child is on its mother. We respect our mother and love her, we respect our family and love it and draw what benefit we can from it. A good son does not rob and abuse his family. The giving and the taking must be mutual. There must be mutual respect and we must give in order that we may receive. Our seniority in the family of nature has given us extra power, but also extra responsibility. How do we discharge this responsibility?

The drive from Lagos to Ibadan shows the newcomer a sorry spectacle. What was once a magnificent forest is now a tangle of shrub and creepers. Here and there a large tree reminds us of the former splendour. Man has been cutting and burning the forest away without any regard for the future, so that he can grow cassava, yams, bananas, cocoa and maize. He has done it to get food and earn a living. The land has been robbed. It has been forced to give, and nothing has been given back to it.

Man must live. It is his birthright to get enough to eat, and to have protection and security. With the quickly growing population the demands on nature grow. The soil must be tilled where possible, and the live stock must be increased to cover the larger demand for protein. But for each tree that falls and for each acre that is cultivated the future supply of timber sets a problem. Timber is needed for houses, for furniture, for ships, for numerous other purposes. It takes many years to grow a tree, perhaps even the life time of several generations. It may take less than an hour to cut down a giant. True enough we can plant fast growing trees, but the timber they produce is less valuable than that produced by those that grow slowly. Some timbers have become rare. Good Cuba mahogany

and good Burmese teak have become scarce on the world market. If we do not make sure that for each tree we cut there is a replacement; if we do not ration our cutting with the view of supplying our children, grandchildren and even great-grandchildren, then we shall be rightly accused by them of having lived at their expense. Therefore forest areas must be preserved and brought under management. Foresters everywhere fight against great odds to make people understand the necessity of controlled utilisation of the forest and the importance of replacing those trees that have been removed.

Not all forests can remain and much indigenous forest must give way for more economic, faster growing exotic trees and for agricultural purpose. This clearance of the forest must, however, be done in an economic way. It must be done with forethought.

Much has been done in the past by the various governments in Africa to clear large areas of bush to combat tse-tse flies or malaria and such attempts lead to changes in the ecology of the area. If the ecology of the area concerned is not studied beforehand the labour may be wasted, and the results may even be disastrous. There are places in Africa where all game has been slaughtered and the bush cleared to combat Nagana (a disease which is carried by tse-tse flies) so that domestic cattle could be introduced. The results have sometimes been very disappointing because the land afterwards proved unsuitable for the grazing of cattle. The money has been wasted and the wild animals which could have served as a meat reservoir have gone forever.

Changing a country's ecology can be dangerous. Cutting of forest, burning of grass and over-grazing and tramping down the vegetation can be disastrous. Fires are one of the greatest curses to Africa. Grass burning at wrong times may promote the growth of unpalatable grasses or the development of undesirable shrubs. Fires may cause irreparable damage to forest trees and they may remove the protective cover of the soil which should hold back the rainwater. If, however, burning is done with care and forethought it may be used to advantage, but it must always be kept in mind that burning is a two-edged sword.

All trees were felled and all bush was cleared in the Orange Free State in South Africa with the result that the desert is spreading with alarming speed into the former fertile country. There is an indication that the spread of the desert in northern Africa is partly due to the cutting of trees and the over-grazing. When I worked in the Kalahari Desert on the border of South West Africa, Bechuanaland and South Africa, I saw clear signs of overstocking with caracul sheep. The dunes which had been resting for centuries reverted to naked, moving sand hills wherever a caracul farmer moved in. Quickly the comparatively rich vegetation disappeared and gave way to a desolate desert. In the mountains of Northern Transvaal the thick jungle along the gullies and water courses was removed with the result that the sources of the rivers dried up and irrigation of the farms on the

plains below became virtually impossible. When the rain fell there was no vegetation to hold back the moisture and the rushing water cut its way into the arable land and carried the good soil out into the sea. The picture altered when natural jungle and controlled, well-planned forestry was re-introduced along the former springs and on the steep slopes. I shall never forget the pride with which the then 82 years old pioneer Merensky showed us the clear water that again had begun to trickle steadily down the mountainsides. In Basuto land where all forest has been cut, I have seen gullies 30-40 feet deep spread into former fertile pastures, and on Madagascar I once saw an amazing illustration of what can happen when the forest is thoughtlessly cut. From the western boundary of a thick forest with gigantic 150 feet high trees ran a grass-covered belt of perhaps a mile in width. This belt was all that was left of a much larger area. Huge gullies, perhaps 100 feet or more deep had been carved into the fertile land by the rushing waters, like scratches of giant claws. Yet, unperturbed by this magnificent illustration of what happens when the forest is removed, the local population continued felling.

From what I have said it must be clear that without careful research into the nature of the ecology we cannot expect the full benefit of the natural resources. We may even ruin our own future and that of those coming after us. We must go carefully with Mother Nature. We must treat her gently and find out how much she can give. We may discover that unless we give something back, she may be unable to give us her best. The soil must be studied by soil chemists, soil biologists, hydrologists and various other scientists. The botanist, zoologist and physiologist must study the life in, on, or above the soil, and the micro-climatologist the climatic factors which influence all life. Based on the findings of these scientists the agriculturist and the grazing expert may draw conclusions about how best to utilize and perhaps even improve the nature of the land and its life.

I recall from my first expedition to the Kalahari Desert what a lot of madmen we appeared to be. One man with strong spectacles and a most learned appearance walked about bent double all the time picking up small insects from beneath the sparse vegetation with a pair of forceps. Another equally learned and bespectacled gentleman ran about like a lunatic swinging a butterfly net. A small geologist wanted to be dumped in the middle of nowhere, 20 miles from our base camp, with a helper, a spade and masses of small bags. When we came in the evening to collect him we saw a new hill, or rather a volcano from the top of which came puffs of sand and dust. Having reached the edge of the crater we saw deep below us, perhaps 10 feet down, a man still digging and throwing up sand and a small smiling geologist still putting samples into bags.

We looked a crazy lot, but what results we had when we put together our observations! What we had found could throw light on the grazing and carrying capacity of the desert, on the water

resources and the animals' ability to survive, on health and on many other questions. This was the beginning of a large research team which was sponsored by the South African National Parks Board of Trustees.

The reason I like to emphasize our work in the Kalahari is because I saw there the importance of having a completely undisturbed nature for research. We had antelopes by the thousands, lions, leopards, hyenas, jackals, vultures, porcupines and insects. Three to four days after a lion or leopard had killed a buck there were no more traces of the drama to be found. The animals hunted (except for the antelopes) had finished off the carcass completely and shared it among themselves. Hide, bones, stomach contents and excrement had all gone.

It was by comparing what I saw in the Kalahari, and in other places, that I became aware of our responsibilities for the land. Not only did I begin to view the problems of farming and grazing with a new and greater interest, but I began to see many of the problems with which the ecologist is faced. The problems of management had a new meaning. On my travels throughout Africa I have met the same problems everywhere. Burning, cutting of trees, overgrazing, soil erosion and killing has been the picture everywhere, but not equally bad all over the Continent. A visit to Queen Elizabeth Park in Uganda is most instructive. The hippos are too numerous. On their nightly grazing excursions to areas often far away from their wallows, they tear the grass off at the roots with their thick hard lips. The protecting cover of the soil, and the food for other animals disappears, and wind and water begin their devastating work. Then come the long dry seasons, when food becomes scarce and the grass eaters die by the thousands. There are not enough carnivores to cope with the sick and dying animals. Only a small pride of lions and a few hyenas and jackals are preserved to clear the land. The carcasses rot away, wasted and useless to everybody. They cannot even go back to the dust from which they arose and they are left to spread diseases. It is so obvious that nature is out of balance.

Man can benefit from nature protection in many ways. I know a former crocodile hunter who settled on the shores of Lake Baringo in the Rift Valley of northern Kenya. He was alarmed by the rapidly decreasing number of crocodiles and wanted to take up commercial fishing instead of hunting. At the time he took up fishing as his new career he persuaded the government to prohibit killing of crocodiles on the lake. The consequences came as a surprise. The crocodiles liked to go fishing on the breeding grounds of the fishes, and were regularly causing damage to the nets of the local fishermen who also liked to fish there. As they increased in numbers they became such a nuisance that the fishermen decided to set their nets in deeper water. From then on the fish population of the lake

increased to such an extent that the sale of fish now forms a major source of income for the locals.

This experience shows us how important the protection of the breeding animals is. The farmer protects his breeding animals and maintains a basic stock. The annual surplus he kills and sells for food. Why is it then that the same farmer tries to kill every wild beast he encounters? Is it that the governments have not sufficiently emphasized that the wild animals are public property belonging to all of us and that they should serve to the benefit of us all, not only for Peter, David or John? Let us preserve a breeding stock and crop the surplus.

The quality of the grazing in Nigeria seems to vary and so does the animal population. You do not see much game, but it is still there. Many people claim there has never been much game, others tell me that they remember having seen plenty of it long ago and that it has been killed, and others tell me that the game has never formed great herds as it does in East and South Africa. Several people have told me of lack of palatable grasses and lack of water as factors limiting the number of animals. I am inclined to treat all this information with the greatest caution. I have seen more animals in the desert where rain is rare and fresh water non-existent than in any other place. Where there was water it was so salt that it burned ones throat, yet there were game and the vegetation was almost luxuriant. The amount of palatable grasses and bushes was sufficient to support a large animal population. Most antelopes, however, are probably browsers as much as grazers. If the grasses of an area are non-palatable it is likely to be a result of human influence rather than a natural phenomenon. Unwise burning, tilling and grazing with domestic animals has in many parts of Africa caused a deterioration of the vegetation, and it may have done the same here. I cannot believe that lack of water would have caused it. It is well worth remembering that it may take more than a hundred years for land to recover once it has been ruined.

Schmidt Nielsen found in the Colorado, and I in the Kalahari, that much water percolates up from deep down, thus becoming a source for the vegetation and for the animals. The animals may need much water to cover the loss they sustain in their attempts to keep down their body temperature. The diurnal animals which do not hide most of the time in cool subterranean warrens with humid air, can be exposed to extreme climatic conditions. The smaller forms particularly must be able to tolerate high temperatures of perhaps 120-140° Farenheit, and an excessive radiation. Animals in hot places may dress themselves in thick coats which keep the heat out, and some of them can tolerate an increased body temperature of several degrees. Schmidt Nielsen found that the camel suffers no ill effects from a body temperature of 105° Farenheit. An increased body temperature decreases the difference between the temperature of the body and that of the air. Less water is therefore required to

keep the body temperature within its vital limit. Even then, however, great economy with water is required. The sources of water for animals in arid lands are often limited to the free water in the green plant, and that obtained through the body metabolism. The kangaroo rat manages on metabolic water alone. In addition to what is lost through the organs of respiration, the greatest loss of water is through urine and faeces. Animals adapted to arid conditions can concentrate their urine up to three times as well as man can do, and their droppings can be desiccated in their alimentary tract to form hard dry pellets. No animals, as far as we know, store water as free water, but only as chemically bound in fats or other stored nutrient of the body. In mammals a fluctuation of the blood water is fatal, yet the camel, and possibly other animals, can tolerate a loss of water which corresponds to about one quarter of its body weight. It is the body cells that release water. This water can be restored when the camel drinks in about 10 minutes.

From these remarks it will be clear that there is little reason to believe that it is lack of water that limits the game population to its present small number. We must therefore presume that the cause is man. Man has failed to understand that game is his inherited source of protein food which should be preserved. He has failed on that point so our necessary breeding stock is much too small. Now it is time we stopped killing and began to build up what we have ruined. It is high time that game management was brought under effective government control, and it is high time that nature reserves were set aside, not only for the entertainment of people and as tourist attractions which will bring money to the country, but for something much more fundamental for the future of Nigeria, namely for research into the nature of our land and the true management of our resources.

I have so far talked about food, but it is not all animals which are suitable for human consumption. I have already mentioned the importance of maintaining the carnivores as nature's health inspectors, pall bearers and dustmen. Even if we may lose some of our animals to them we must accept losses as our payment for the service they offer us. In many parts of Africa the leopard is totally protected because it keeps down the population of baboons. I have been to places where pythons were protected because they keep down the rats, baboons and other vermin; and to places where vultures and hyenas were protected because they clear away dead animals.

Monkeys and apes are frequently considered with contempt because of the damage they do and many think of them only as good food. Those who mercilessly try to destroy these, our primate cousins, should know what benefit we have had from them. Do they realize that without monkeys we would probably have had no polio vaccine? Monkeys are of the greatest importance to medical research and cannot be dispensed with by those responsible for public health. Being our closest relatives among the animals they are

frequently susceptible to the same diseases as we are and can therefore be used better than any other animal in the study as well as in the combat of human diseases.

It may sound offensive to many when I say that it is not only physically but also mentally that we are related to the monkeys and apes, but it is nevertheless true. Many of their behavioural features are similar to ours and it is undoubtedly the reason why many people either dislike monkeys or find them amusing. People recognise themselves in the monkeys. By a careful study of primate behaviour we learn about human behaviour and find reasons for many of man's actions. For many years the research workers concentrated on the study of captive chimpanzees. Now it is realised that we must use not only chimpanzees but also other primates for our study and that we can only reach the correct conclusions by studying the animals in the wild as well as in captivity.

Let me explain, by a few examples from the lines of research in which I have lately been involved myself, what I mean when I say we can learn about humans by the study of primates.

Half a decade ago Harlow in America began an intensive study of new-born monkeys. He found that monkeys and humans pass through the same phases of reflex, attachment and exploratory behaviour. Like other animals and humans they learn through play and like humans they utilize what they have learned in solving problems even to the extent of combining actions and inventing tools or methods of solving the problems. I have myself been inclined to deny that monkeys could perceive causality and use tools, in spite of claims by Kortlandt and others. However, my own animals convinced me of the correctness of their claims. The baboon, Maco, which can be seen at the Zoo, uses tools and has reached performances which equal those of the most intelligent chimpanzees. We know now from Harlow's experiments that something to cling to and hold on to gives the small monkey a feeling of security. My own observations show that certain centres are more important than others as contact centres. The mouth is the most important one. The teat has two separate functions: to provide food and to give comfort. Only a soft teat gives proper comfort. A hard one may even be rejected as a comforter, but may still be accepted as a source of food. This contact and search for comfort with the mouth has given rise to the kiss. The play bite to the laughter. It has been ritualised. That monkeys cannot laugh is a fallacy. They can laugh and weep like we can, although they weep with invisible tears. Through the handling of animals we can learn how to handle humans. Many animals form societies with a hierarchal organization similar to ours. The strongest becomes the leader. If we handle children we must be the leader; not necessarily by the use of force. We must by our actions take the initiative from the animal or the child. Often I have baffled a threatening monkey by offering it my hand to bite or by pushing a morsel into its mouth. Offer your cheek to the

child that threatens to hit you, but do it without malice. Corporal punishment may be useful and it may give a healthy outlet for the giver, but do use it with care. Do not suppress by using force. Suppressed emotions will in animal and man give rise to eruptions in unexpected ways. The stored nervous energy must have an outlet one way or another. Tinbergen's displacement actions exist in man as well as in animals. The intimidated gull may preen itself; the intimidated monkey may scratch itself; the intimidated human may scratch his head, or when a child is severely intimidated it may wet its bed.

These are just a few examples of lines of research in which I have been particularly interested myself. It is research from which man can benefit. Animals are required for research; sometimes many of them. We must have sources from which to obtain them and the trade gives money. Let us therefore preserve our primates where it is possible to do so.

What I have mentioned so far has been purely utilitarian. What about the sentimental aspects of nature preservation? You Nigerian people find it difficult to understand the sentiment nourished by other people for African nature. Have you ever thought about the reason for it? Why are Europeans and Americans so sentimental about nature? You are in a way a lucky people. Everyone can get out and enjoy the trees, the grass, the flowers, the birds and at least some wild life. You are spoiled and take it all for granted. Although you have some big towns you can still get out of them. Imagine the day when your towns have grown too big, when you can no longer get out, when you are confined to narrow streets and have nothing else to look at but grey walls and stones. I remember it so clearly; when I was a small boy we had the tall grey wall of the neighbouring building stretching to the sky in front of my classroom window. I could not see the sky from my seat but only grey bricks. It made me long for something gay, green, alive. My imagination compensated for the loss and in my day-dreams I saw instead of the wall, dark green forest with all sorts of wonders in them. Some of you may laugh when you visit my country, Denmark, and see how people, starved of the joy of nature, try to compensate by growing common wild plants from Africa in pots on their window sills, but when you understand why they do it you will be touched by the care with which they nurse these plants.

One day you too will have narrow streets with skyscrapers, and one day will come when many of you will not be able to come out of the town without great cost. I prophesy that when that day comes you will cry: "Give us nature back, just a tiny bit of it." It is not natural for man to be cooped up in a small room in a narrow street, and for the sake of his health, his mental health, he must be allowed out into the nature where he after all belongs. "Man does not live by bread alone."

Think about that when you criticize tourists who come to Africa

to see nature, and pity them. Pity still more those that cannot afford to come. Be proud of your heritage and praise your God that some wild life is still left over. Go warily, go gently with mother nature. Protect and preserve the nature of your country.

What I have said here will reach out to only a handful of people. How do we bring the ideas across to the great masses? We will need a big and costly machinery of propaganda. We need the co-operation of schools, papers and films. We need laws and somebody to ensure that they are carried out and obeyed. We need an immediate establishment of nature reserves with well organised and equipped rest camps for tourists and research workers. These reserves must be well managed and patrolled to keep poachers away. They must be areas picked out by experts as typical of Nigeria or as rare and particularly interesting examples of nature of scientific importance. Children from all over Nigeria should at least once in their school years have an opportunity to spend some days in a reserve. Afterwards they should write essays about their experience and a prize could be given annually for the best essays written in Nigeria.

For those who cannot afford to visit the reserves, substitutes must be found. I think here about biological gardens. We have seen how people stream to the small Zoo at the University College, and what interest is shown in any new animals or alterations. It is a sign that already here in Ibadan something is amiss. People here are beginning to feel strangers in nature and subconsciously they are longing for something. Although a remarkable effort of Professor Webb, Mr. Walker and others who created it, it is not a Zoo as a Zoo should be. If only we could get the financial support we could begin to build in 1963. We could combine Botany, Zoology and Agriculture into a demonstration of natural life and its utilization in Nigeria. There should be some natural vegetation, some systematically arranged plants, animals in enclosures without bars and fences moving in their natural surroundings, and there could be cattle in improved, well managed pastures. There could also be domesticated or semi-domesticated antelopes which might be useful in marginal lands where the cost of bush clearing and cultivation may be disproportionate to the income possible from conventional livestock and crops. And on the site of such an area we could have our institute and museum of African Studies. Today a Zoo or a botanical garden should not be an institution where the public see everything "out of context". It should be an important educational institution which inspires and gives ideas, teaches people about their country and shows them the most profitable way of doing things. It would be possible here at the University College, thanks to the position and the layout, to create a biological garden which would be unique in Africa if not in the world. But we need money and help.

You may say that we will never manage to persuade people that nature protection is necessary. I tell you that my experience in

Africa has taught me that a determined educational propaganda can change public opinion within a few years. Before the Nationalist Government came into power in South Africa, the Nationalists promised the farmers of Northern Transvaal that if they obtained the majority at the election they would close down a certain game reserve and open it up for farming. Ten years later, when elephants crossed the Limpopo and began to raid the farms, a conservation officer was sent out to shoot the elephants. There was such a outcry in the papers that soon plans were being worked out for the creation of a new reserve. In parts of East Africa the education in the schools and the visits to the reserves have had such an impact that the Africans begin to protect the wild life. The Meru tribe made its own game reserve. In Kigesi, the Impenetrable Forest, so I was told, was made a game reserve on the request of the local chiefs. A student we sent from Makerere to Kenya came back and reported to me: "It is curious; when I talk to the European officials they all talk about the economy of game; when I talk to my own people they talk about having game because they like to look at it." From Northern Rhodesia I was told: "The Africans like the game to look at" and in the Congo we have learned that the Albert National Park has been running better under African administration than ever before. Why should we not be able to do just as well or even better here in Nigeria?

* In Nigeria the cost of cleaning one acre of bush is said to be approximately £75.