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## Africa's land must grow Most Food for Most People

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EDWARD ROUX

A FEW YEARS AGO the Council of the South African Association for the Advancement of Science adopted a resolution, moved by Professor Raymond Dart, expressing concern about the future of the mountain gorilla. This interesting anthropoid, with the possible exception of the chimpanzee, man's nearest living relative in the animal kingdom, seems doomed to extinction unless protective action is taken, and that fairly quickly. Its only habitat is the mountain forests of the Ruwenzori Range which lie on the borders of the Congo, Uganda and Ruanda.

Unfortunately for the gorilla, the soil on these volcanic mountains is extremely fertile, and the indigenous peoples have been steadily extending their cultivated land higher and higher up the slopes of the mountains. With each extension of cultivation there is destruction of the forest and consequent confinement of the gorillas to an ever narrowing area.

The Association's proposal was that approaches should be made through the United Nations to secure international action to save the gorillas. This could only take the form of persuading the governments concerned, those of Belgium and Great Britain, to exercise their authority in proclaiming the mountain forests as inviolable nature reserves and by legislative or administrative action preventing any further encroachment by agriculturalists. It was admitted that this procedure, even if accepted by the British and Belgians, would be only a temporary expedient since the African territories concerned were due shortly to gain their independence. When it was pointed out to Professor Dart that some more radical and permanent solution was needed, such as trying to interest the African peoples in the scientific value of the gorillas, he replied that this would raise too many difficult issues and involve the Association in politics. Since then the Belgians have left the Congo and the independence of Uganda and Ruanda is imminent.

It is plain enough that the gorillas are doomed unless the African peoples in this region themselves think it is worthwhile to save them. And what goes for the gorillas goes also for the indigenous fauna and flora of the continent as a whole.

The idea that the varied and wonderful animals and plants of this planet are worth preserving for aesthetic and scientific reasons, and apart from any utilitarian

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value they may possess, is a sophisticated one, not shared by the majority of mankind in Africa or any other continent. It is advocated by nature lovers and scientists. Since scientists are considered useful by governments they may be able to exercise pressure on authority for the conservation of fauna and flora. African states with few or no scientists are likely to pay little attention to world scientific opinion asking that this or that animal should be preserved for scientific study or merely because it has aesthetic or cultural value.

If white scientists in Africa are really concerned about the preservation of nature they should make it their business as quickly as possible to teach and train a body of indigenous scientists and to imbue these men and women with ideas about conservation and protection. In this regard it is interesting to note that the South African Association for the Advancement of Science, now about to celebrate its diamond jubilee, does not possess a single African member. This is bad enough, but what is more tragic still is the fact that the great majority of its members are probably quite unaware, after sixty years of advancing science in Southern Africa, that they have failed dismally in the most important task which history has set them.

I have used the example of the mountain gorilla to emphasise the urgent need for training African scientists. But the problem of conservation is not the concern merely of nature lovers and pure scientists. It is a problem of the gravest social and economic importance, for it is linked up with the vital questions of food and population.

As a botanist with some interest in social matters I am often asked my opinion as to how far food production is likely to keep pace with expanding population. In particular one is asked about the situation in one's own country, which I would like to think of as Capricorn Africa, for the Limpopo should not set a boundary to one's views on this matter.

In the first place it should be pointed out that

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Africans south of the Sahara are grossly undernourished, and diseases caused by malnutrition are rife. This is true of the Republic of South Africa, but even more of the countries further north. The common disease called "tropical ulcer" for instance is known to be due to lack of proteins and certain vitamins and not to tropical conditions as such. In the opinion of nutritional experts in the Federation, the most important contribution of Kariba will not be electric power but the quantities of cheap fresh fish the lake is expected to produce. Recent press reports on the ploughing-in of bananas in the Republic and unsaleable surpluses of butter and cheese, may suggest that there is plenty of food if only it can be made available. But even if these "surpluses", produced by economic ineptitude, could be distributed to the needy, such action would hardly provide adequate diets except for a few hundred thousand people for a week or two.

The application of science to agriculture and the rationalisation of farming combined with irrigation schemes could undoubtedly raise food production considerably. Quite possibly by the end of the century the Republic will be able to feed more or less adequately the thirty or so million people we expect to have by then. To achieve this it will be necessary to carry out an agrarian revolution in the Native Reserves, substituting modern methods for the wasteful and inadequate tribal agriculture at present practised in these areas. Whether the present government will be able to achieve this in its Bantustans remains to be seen. Complicated issues will arise in these areas which I do not propose to discuss in this article.

With regard to conditions in the tropical parts of the sub-continent, some interesting theoretical propositions have recently been put forward, and have achieved publicity in the writings, among others, of Julian Huxley. Most of Africa between the Limpopo and Kenya consists of tropical savannah. In these regions Africans in the past have practised a form of shifting cultivation. The forest is chopped down and the trees piled and burnt to clear areas for crops. After exhaustion of the soil, new areas are cleared and the process continued. This method allows for partial regeneration of the forest and has some conservation value provided the population is small and large areas of land are available. With an increase in the numbers of cultivators regeneration is inadequate and erosion sets in. At the same time the area available for the natural maintenance of game animals is steadily reduced and these suffer further from shooting and trapping on a large scale.

Indigenous methods of agriculture thus prove completely inadequate after the population reaches a certain size, while food supplies from non-agricultural sources

also decline. Does "modern" agriculture provide a solution to this problem? In the view of Huxley and others it does not. Modern agriculture involves the clearing of large areas and the use of the plough. This is all very well in temperate countries, but in the tropics it does not work. Tropical soils are subject to high temperatures and heavy rainfall. This leads to rapid oxidation of humus and leaching of the soils (the washing away of mineral nutrients). When the soil is covered with forest, fertility is maintained, but with its removal, fertility rapidly declines. Contrary to popular ideas, the tropics are not that vast potential source of agricultural foodstuffs that they are sometimes thought to be. Scientific agriculture has not in fact solved the problem of exploiting the warm wet lands of the earth.

The suggestion now put forward is that the tropical savannah should not be burned and ploughed, but should be left as near as possible in its natural state. No attempt should be made either to introduce domestic animals, even if these could be acclimatised and rendered immune from tropical diseases. On the contrary the indigenous game animals should be allowed to return and multiply and these should provide man with the necessary protein. Carnivorous predators, such as lions and leopards, should be reduced in numbers, the surplus they previously took being taken by man, who would then maintain the game population at its optimum level to provide food for humans. Presumably small selected areas would be put under rice or bananas to provide needed carbohydrate, or this could be imported in exchange for biltong!

This is a new and revolutionary idea, and all its implications have not yet been worked out. If it is adopted it is clear that there must be a limit to the human population an area of savannah could support on an adequate nutritional level. But this is true of every region of the earth, tropical or non-tropical.

And this brings me to my final comment. It is wrong, I believe, to approach this problem of food and population purely in terms of how extra nutrition is to be provided. We must realise that if man is to survive on this planet he must find means of restricting his growth in numbers. I need not discuss the malthusian argument except to say it has never been refuted.

By drastic methods we can raise food production to very high levels and increase population accordingly. We can exterminate the mountain gorilla and a hundred thousand other interesting animals and plants. But it will be a sorry world where there are no animals and plants but domesticated ones and our land surface is covered with skyscrapers with hydroponic tanks on their roofs. I believe population should be optimal and not maximal and this is one of the reasons why I like Huxley's idea about limiting agriculture in Africa. ●

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