

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 ⁴⁵⁰ 260 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~~ ^{effect} sanctuary, 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-*

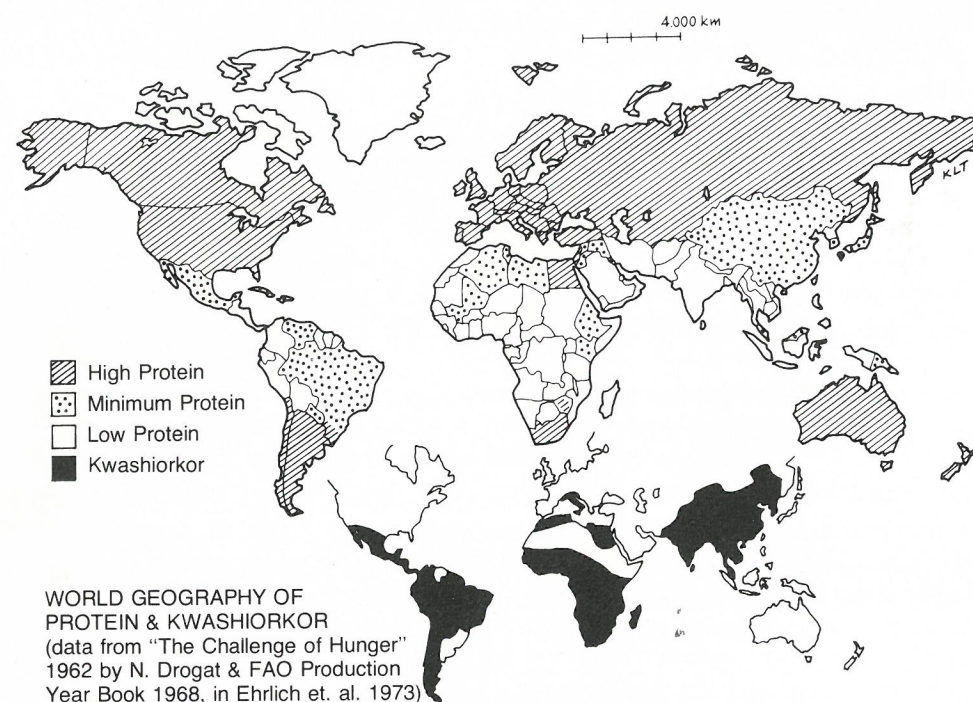
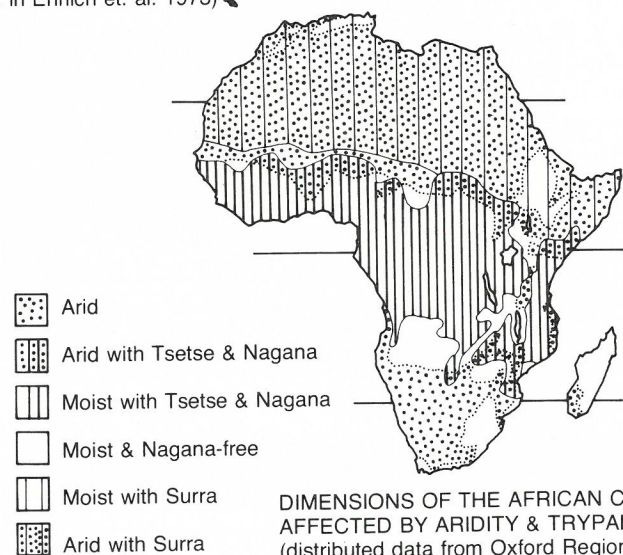


Fig. 1



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 Greco-Roman 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

30.000!
unofficial
report

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 6000 hectares in the Zululand thornveld. In the first year, 1972, 100 animals were culled for hunting only, fetching R7500. In the second year 350 animals for hunting only, fetched R25000. In the third year 1800 were culled for red meat production plus hunting, providing R90000 (of which twenty per cent was from hunting). In the fourth year (projected) 2800 would be cropped, fetching R140000 (Arnott 1974). In addition, a small meat-processing factory was built locally at a cost of R90000 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). *Permaculture*
 - Capital-less resource production (e.g. protein from wildlife).
 - Replacement of scarce resources (e.g. firewood) by establishment of plantations to save indigenous forests. *& charcoal*
 - 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).

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 bee-keepers. 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 firing 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?

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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