OPEN LETTER

The Footprint in the Sand

Deserts are expanding throughout the world, hillsides are being washed away, reservoirs are silting up, and the entire Biosphere is becoming polluted. Directly or indirectly, one of the main causes of many of these misfortunes is the destruction of woods and forests. Agriculture has been responsible for much of the deforestation in Europe and North America, and more forest is being destroyed today throughout the world to make farmland than to supply industrial timber. Half of the trees felled are used for fuel and, in some desert countries, 30% of the average family income is spent on fuel for cooking. As most educated people are now aware, particular concern is being directed, these days, to the destruction of the world's tropical rain-forests—most of which will, in all probability, disappear before the end of the present century—and to desert encroachment.

Unfortunately, these two vast environmental problems are not unrelated. It is only a short step from 'green jungle' to 'red desert', as some of the inhabitants of Brazil are learning to their cost! Whether or not the United Nations Environment Programme (UNEP), the International Union for Conservation of Nature and Natural Resources (IUCN), and other international agencies, are successful in persuading the governments of the countries concerned to initiate programmes to preserve some of their forests and to combat desertification, the problem will still remain of dissuading the local people from indulging in 'slash and burn' cultivation or serious overgrazing (according to the region and other circumstances involved).

Removal of Tropical Rain-forests

In 'slash and burn' cultivation, trees are felled and burned, following which crops are planted. After a year or two, the fertility of the soil decreases, the clearing is abandoned, and a new one is created. Although the largest trees are often spared, the smaller trunks and branches are piled together and burned as soon as they are dry. Partly-burned wood is gathered up for a second time and burned again. Even so, the ground becomes littered with charred or partially-destroyed logs and branches, while dead stumps, cut off a metre or so above ground-level, remain scattered throughout the clearings. Seeds are planted irregularly with the aid of a hoe or digging stick, and no attempt is made to plough the land (Fig. 1). All too often, clearance of vegetation followed by brief cultivation on steep slopes results in devastating erosion, such as that shown in Fig. 2.

Whilst the ecologist cannot but abhor the irrevocable disappearance of one of the world's greatest biomes which is certainly its most complex, at the same time one cannot help feeling sympathetic towards the people who are actually removing the trees. It is hard to imagine a more claustrophobic and uncomfortable environment to live in than equatorial rain-forest. Not only are its human inhabitants beset by irritating pests such as mosquitoes, blackflies, chiggers and, in some places, land-leeches,

FIG. 1. *'Slash and burn' cultivation on the Amazon near Iquitos, Peru, August 1983. (Photo: J.L. Cloudsley-Thompson.)*

but the oppressive humidity and heat can be almost intolerable. No wonder that people like to let in a breath of fresh air! At the same time, they need to eat, and the land cannot support them unless they remove the forest and plant their crops.

The idea of preserving tropical rain-forest for sentimental or even scientific reasons alone is widely unrealistic. On the other hand, attempts to replace it by 'western type' farming are not likely to succeed either. Perhaps the more sophisticated types of 'corridor' systems of agriculture may, in the long run, be the best and least harmful to the environment. As the ground cannot be left bare, however, well-established perennial crops such as rubber and palm-oil must be exploited to produce some income for the human inhabitants. C.L. Strauss once wrote: 'Civilization is no longer a

FIG. 2. *Removal of the vegetation cover for firewood etc. in Haiti has exposed this hillside to severe gully erosion. (Photo: Mark Edwards, UNEP.)*

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fragile flower, to be carefully preserved and reared with great difficulty here and there in sheltered corners of a territory rich in natural resources.... All that is over: humanity has taken to monoculture, once and for all, and is preparing to produce civilization in bulk, as if it were sugar-beet...' (transl. from *Tristes Tropiques*, Librairie Plon, Paris, France, 1955). The Amazonian Indians and the African Pygmies are among the few people of the world who are able to persist and thrive in a rain-forest ecosystem without damaging it. And, when it has been destroyed from without, they, too, will disappear for ever as ethnic entities.

Human Misuse to Blame

Astonished by the stupendous size of the trees and the luxuriant growth of the vegetation, early explorers wrongly assumed that the tropical soil must be prodigiously fertile. This dangerous illusion has long been dispelled in scientific circles; but it still persists in the political and governmental ambit. Herein lies the great threat to the rain-forest, because the fertility of the soil is actually extremely low, so that agricultural activity invariably presages environmental damage, and any commercial gain can, at best, be only short-lived. A comparable situation obtains in the desert. Because irrigation schemes, initially, can be highly productive, it is often forgotten that, in some regions, water is a 'fossil' resource which is not being replaced—as in Libya, Texas, and Baja California, where its exploitation can be only temporarily beneficial. In other regions, the results of irrigation schemes are salinity, waterlogging, malaria, schistosomiasis, and degradation of the land.

Desertification is caused almost entirely by human misuse of the environment, and especially in fragile, 'marginal' areas with erratic and low annual rainfall. This misuse, which is not necessarily the result of ignorance, takes the form of felling trees to provide fuel, overgrazing by domestic animals, and harmful agricultural practices such as planting crops up to the very edges of the *wadis* and thereby enhancing soil erosion. Although it is theoretically possible to halt and even reverse desert expansion, the pressure of the human population does not usually permit recovery to take place. To restore lands that are currently being degraded would require a strong political will and the power to implement the necessary measures. These include population control, enforced emigration, and education, as well as control over the use of land and water. Few Third World governments would dare to tackle such inflammatory issues and, even if they did, they would almost certainly be unsuccessful in the attempt.

Solutions Well Known

The scientific and technical solutions to the problems of the arid lands are well known; the difficulty lies in their application. What nation—except, perhaps, the Chinese—has yet solved its population problem? Desertification will never be halted, and the wasted lands rehabilitated, unless the pressure of the human population on the environment can be reduced. The view is often expressed that misuse of the land is due to the ignorance and selfishness of its inhabitants. To some extent this may be true; but the nub of my comments is that, conversely, desert peoples tend to be unusually intelligent, enterprising, and self-reliant. If they were not, they surely would never survive.

International and governmental agencies that do not take the human factor into account are overlooking the most valuable of natural resources. Mud-brick and adobe houses are cool, comfortable, and well adapted to the desert climate. Only local resources are exploited in their construction (Fig. 3). Just as Amazonian Amerindians and the Negrillos of Zaire can live in ecological balance with their environments, so also might the inhabitants of the world's arid regions—but for one thing. Infantile mortality prevents a population explosion among the indigenous inhabitants of rain-forest, while closer contact with Western culture has to some extent abolished this restraint in the desert. Moreover, it is very much easier for the Westerner to reach a common understanding with desert dwellers than with the inhabitants of tropical forests. Whereas Amerindians and Pygmies are shy and tend to disappear into dense vegetation when approached, nomads and pastoralists have no such inaccessible retreats. At the same time, the cultural gap between the man on the camel and the conservationist in his Range Rover is no great barrier, especially in difficult terrain, and may even be reversed when the vehicle breaks down!

FIG. 3. *Brick-making in the Thar desert near Jodhpur, India, February 1978. (Photo: J.L. Cloudsley-Thompson.)*

People the Real Crux

The failure to halt desertification is basically due to inability to reduce human pressures on the environment.* This could only be achieved by encouraging multiple land-use and restraint in the size and scale of developmental projects in fragile arid ecosystems. The cooperation of the local inhabitants is absolutely essential. Yet these people have often been largely ignored. Not only do their individual needs require consideration—they must,

* A referee comments: 'Halting desertification is primarily the responsibility of national governments—assisted, on request, by the international community (including the UN). UNEP is designated as the body responsible for following-up and coordinating the implementation of the [UN] Plan of Action.'—Ed.

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for instance, be given alternative food if their flocks of sheep and goats are to be reduced, and provided with fuel oil if they are not to cut down trees—but they must also be given other incentives. We cannot expect the poor to be altruistic to the rest of Mankind by denying themselves the very sustenance that is necessary for life—even though many of them are, in fact, amazingly generous and hospitable. Fig. 4 is symptomatic of desert 'life', and has in part inspired this contribution.

Governments and international agencies tend to overlook the solitary individual, whose interest is what really matters. As an anonymous writer has emphasized, all human beings tend to be isolated—especially desert dwellers, both in metaphor and in fact:

'Each of us treads a lonely path
Through the treacherous waste called "life"
Each of us thinks there's companionship—
A friend, a husband, a wife—
But the desert is our dwelling place
With nothing but sky and land;
Hopes and beliefs are delusions
Etched by the wind in the sand.
Solitude's the only prize
From the moment we leave the womb,
And what fair Spirit can ever cross
That endless expanse round the tomb?'

Desertification will never be halted—much less at all widely reversed—unless and until the politicians and decision-makers in the national governments involved, and also the staff of conservation agencies concerned, can learn to *gain the support of individual desert-dwellers* by getting to know them and to respect their needs and aspirations far more than is the case at present, and then by advising and helping them with their personal as well as collective problems.

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FIG. 4. *The impress of Man too often leads to devastation and desolation—in the case here illustrated, to extreme desertification. (Photo: Dr W. Ted Hinds, Battelle Pacific Northwest Laboratory.)*

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