

The

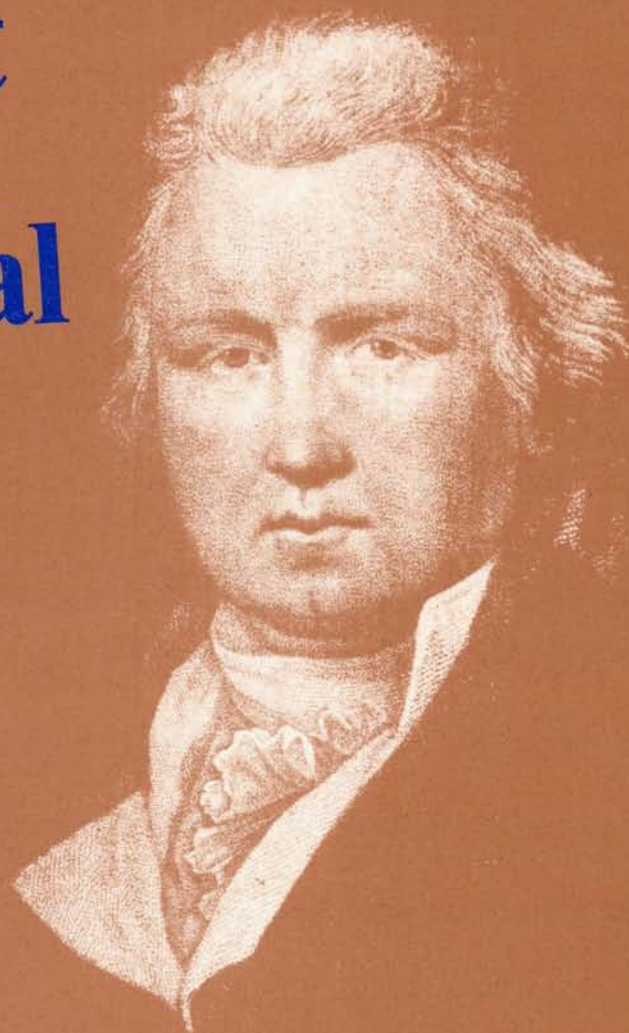
Ecologist

Journal of the Post Industrial Age

Vol.6. No.8.

October 1976 45p

William Cobbett and the National Debt



Australian
Uranium
Politics

How
the Enga
Cope
with Frost

The
Ecology
Movement
Re-Examined

BACK NUMBERS OF THE ECOLOGIST

Complete your set of The Ecologist. All back numbers available except Vol. 1, 12 and 14 (out of print) and Vol. 1.11 and Vol. 2.5 which are rare and only available in complete issues as follows:

VOLUME 1 (16 issues) July 1970 – December 1971 £8.00 (\$20.80)

VOLUMES 2 & 3 (12 issues) 1972, 1973 £6.00 (\$15.60)

VOLUMES 4 & 5 (10 issues) 1974, 1975 £5.00 (\$13.00)

SINGLE BACK ISSUES

55 (\$1.40)

BINDERS FOR THE ABOVE and for **VOLUME 5** £1.75 each (\$5.00) add 20p each (50 cents) for postage

Indices for Volumes 1, 2, 3, 4 & 5 50p each (\$1.30) or £2.00 (\$5.20) for the set.

Order from Subscription Dept.

The Ecologist, 73 Molesworth Street, Wadebridge, Cornwall PL27 7DS

SOME IMPORTANT ARTICLES FROM PREVIOUS ISSUES –

The Medicine of Industrial Man. *John Powles.* The engineering approach to medicine does not work. What is required is an ecological approach. October 1972.

Evolution and Health. *Stephen Boyden.* Human health is best assured when man lives in the environment he was designed for by his evolution. August 1973.

Unravel the National Grid. *Andrew MacKillop.* A plan to decentralise power generators in Britain. November 1973.

The Ecology of Housing. *Amos Rappaport.* The Social and Ecological factors taken into account by traditional societies in the design of their settlements. January 1973.

Living Off the Sun. *Andrew MacKillop.* What are the possibilities offered to us of solar energy? July 1973.

The Costs of Urbanisation. *Kenneth Watt.* The Social and Ecological costs of creating large conurbations must eventually be reflected in higher monetary costs. February 1972.

Anarchism and Ecology. *George Woodcock.* The anarchists were the true predecessors of the human ecologists of today. March/April 1974.

Is Science a Religion? *Edward Goldsmith.* Science promotes a quasi-religious and very subjective world view which underlines our industrial society. February 1975.

Fall of the Roman Empire. *Edward Goldsmith.* A sociological and ecological interpretation. July 1975.

Can We Feed Ourselves. *Michael Allaby.* A study of Britain's food producing potential. July 1975.

Non-Violence Triumphant. *Solange Fernex.* 20,000 people sat in, in one year, to prevent the building of a nuclear power station. December 1975.

Energy and Economic Myths. *Georgescu-Roegan.* Modern economics is irreconcilable with the laws of thermodynamics. June & Aug/Sept 1975.

Knowledge and Values. *Henryk Skolimowski.* Can they be separated? We have tried to do so with disastrous results. January 1975.

The Rural Solution. Articles from part one of our Special India issue deal with future policies for agriculture, water, conservation etc. October 1975.

The Relevance of Gandhism. Gandhi's Political Philosophy and Excerpts from his writings. October 1975.

A Blueprint for Survival. The now famous plan, by Edward Goldsmith, Robert Allen and others, for the achievement of a sustainable society.

In this issue

Volume 6. No.8. October 1976.

EDITORIAL		
Edward Goldsmith	The Welfare Illusion	274
COMMENT		
Jimoh Omo Fadaka	The Cure that Kills	277
FEATURE ARTICLES		
Peter Springell	Australian Uranium Politics Nearly a quarter of the World's known uranium reserves are to be found in Australia. The burning question today is whether to mine or not to mine them.	280
Eric Waddell	How the Enga Cope with Frost The lifestyle of the Enga has evolved in such a way as to provide them with natural safeguards against the consequences of the severe frosts they are likely to encounter.	284
Tupola Efi	After the Shoals the Tin Cans The Prime Minister of Western Samoa reflects on the implications of World Environment Day	293
Molly Townsend	A Babylonish Collection of Names or Sounds A century and a half ago, William Cobbett explained why the National Debt could only grow larger. His observations are no less apt today.	294
Henryk Skolimowski	The Ecology Movement Re-examined A critical look at the rocks on which ecologists may founder for lack of a basic philosophy.	298
Nicholas Gould	NOTEBOOK	301
	This Month's Authors	302
	BOOKS	304
	LETTERS	306
	Classified Advertisements	I/B/C

This Month's Cover: William Cobbett (Photo: Mary Evans Picture Library)

Note: While every care is taken with manuscripts submitted for publication, the Editors cannot guarantee to return those not accepted. Articles published in the Ecologist do not necessarily express the views of the Editors.

Editor: Edward Goldsmith. Assistant Editor: Ruth Lumley-Smith.

Associate Editors: Robert Allen, Michael Allaby, Peter Bunyard, Brian Johnson, Jimph Omo Fadaka, Andrew MacKillop, Robert Waller, Lawrence Hills, John Papworth, John Davoll, Raymond Dasmann (IUCN), Richard Willson, John Milton (U.S.A.), Peter Freeman (U.S.A.), Henryk Skolimowski (U.S.A.).

Advertisement Manager: Philip Hutchings

Advertisement enquiries to: Uphill, Urchfont, Devizes, Wilts. Tel: Chirton (038 084) 370.

Published by Ecosystems Ltd., Registered Office: 73 Molesworth Street, Wadebridge, Cornwall PL27 7DS, U.K.

Distributed by: A.M.D. Ltd., Roding Trading Estate, London Road, Barking, Essex IG11 88U.

Printed by Penwell Limited, Parkwood, Callington, Cornwall. Tel: St. Dominick (05795) 522.



The Welfare Illusion

It is undoubtedly true that welfare is playing an ever increasing role in the life of industrial nations, but to what effect? Does it really serve to eliminate poverty? In the U.S. the Office of Economic Opportunity (OEO), was set up as part of the Government anti-poverty programme. In the space of a few years it succeeded in spending billions of dollars, yet, as Howard J. Phillips, its Acting Director, admitted, "some of the projects founded by this agency have kept a lot of people comfortable in their poverty, but this agency has not done enough to lift people out of poverty". But can this really be achieved by means of welfare? The Health, Education and Welfare Office (HEW) has taken over the OEO projects. It is at present spending over a hundred billion dollars a year, *but the more it spends the more it seems to need*. At the current rate, the figure should increase, within the next ten years, to something approaching five billion dollars, or nearly half the total GNP of the U.S. today, which in view of the host of other massive expenditures which are required to keep that increasingly unstable society functioning, will simply not be available. If it were it would mean that just about two thousand dollars worth of welfare (equal to forty times the income of the average citizen of India) would be heaped on every man, woman and child in the States.

Even in the U.K., more than two thousand five hundred million pounds are spent annually on social benefits, and this only represents a fraction of the true cost of welfare, which should include the vast sums spent on education, housing and health. Although the country cannot afford the present cost of these services, it is likely to increase very substantially. Sir Keith Joseph, during the last Conservative Government, asked every Local Authority to submit to his Department of Health and Social Security, plans for the development of social services in the next decade. Significantly, this was the first time that forecasts of expenditure had been asked for so far ahead. The results were quite frightening. Well before the ten year period is through, social work and 'caring' organizations will be among the most significant employers of manpower. If one takes into account the ever increasing number of clients, this represents a huge section of the population who are either helping or being helped and are supported or subsidised from rates and taxes.

Among other things the forecasts showed a need for three hundred thousand extra social workers to deal with individuals and families who have become as much hooked on social benefits as any teenager on drugs. In industrial countries the numbers who have become dependent on welfare is indeed alarming, and this increases all the time. In the U.S., it has gone up from about four million to fifteen million in ten years, and no end is in sight.

What is more this trend has very serious social implications. We tend to classify the members of our

industrial society in accordance with whether they fulfil manual or intellectual functions, whether they are blue collar or white collar workers, whether, in fact, they belong to the working classes or the middle classes. This is an increasingly unsatisfactory distinction. Many manual workers have become as affluent as intellectual ones. They have come to be, from the sociological point of view, absorbed in the middle classes, and are as conservative as they are, perhaps indeed more conservative, since they do not tend to share their liberal conscience. The key distinction should now be between those who regard themselves as part of society, in that they have a definite status within it; it provides them with a goal structure and a socially acceptable means of achieving it, and those who, on the contrary, live on its periphery and do not really belong to it. Homer referred to these latter as "the hearthless, clanless, tribeless ones". Plato described the proletarian of a Hellenic city as "he who dwells within the city without falling into any of the categories of the city, whom one can call neither trader, nor artisan, neither knight nor hoplite, but only poor or indigent". It is they, as we shall see, who are the true poor — for whatever material benefits they may obtain, these cannot compensate for their lack of identity and their social deprivation.

Indeed, according to Jordan, in his book *Paupers*, welfare is systematically creating a new class of poor. A combination of low wages, high prices and numerous rebates ensure that the harder they work, the worse off they become. Eventually they sink into the 'poverty trap'. When this happens they slowly become distinguished from their more successful working-class fellows, who despise them as idlers and scroungers. Thus these two groups grow further and further apart, for their interests are manifestly different. "The worker tries to maximize his work through overtime, bonuses and productivity deals and to minimise his contribution through rates and taxes. The claimant tries to maximize his income through claims and avoids work because it may often reduce his income."

Attitudes are bound to harden and, as Jordan points out, "the policy of the Labour Government, by pressing for higher benefits and pensions which will diminish the number of independent workers and increase the number of paupers, can only accentuate this trend". It is leading also to the development of a right wing working class that wishes increasingly to distinguish itself from the claiming class, and that has ever less sympathy for the welfare orientated policies of Labour's left wing.

The answer, it might be argued, would be to avoid providing welfare on the present scale. But is this possible? How can an elaborate and highly vulnerable industrial society function if it harbours in its midst a vast multitude of starving and desperate people? Something must be done to make their life tolerable —



even if it be but in order to prevent them rising up to destroy the society which so effectively excludes them.

In fact welfare, with all its attendant evils, is an inevitable part of industrial society, and it seems likely that when welfare services break down, as soon they must, the most terrible chaos will ensue, leading more often than not, to the collapse of any semblance of social order.

If the countries of the Third World have been able to dispense with elaborate social services, it is that their traditional social structures have survived. In such conditions welfare is ensured, as it was in the past, by the family and the community, without the aid of Governmental institutions. If life in Calcutta still goes on, in material conditions which people in the West would regard as quite intolerable, it is because the Hindu culture, which ensures the cohesion of the family and the small community, is so strong.

Welfare services, in a modern society, are not only required to cater for the problem of unemployment, but for all the other consequences of the breakdown of the family structure. Families are no longer capable of looking after their own old people, who are consigned in increasing numbers to institutions for the aged. In the U.K. a vast proportion of the patients in mental institutions are in fact old people who simply have nowhere else to go. Also a growing proportion of hospital beds are occupied by old people suffering from minor ailments which, because of their age, suffice to make them incapable of looking after themselves, but whose condition is unlikely to be improved by medical treatment. In the U.K. the care of the age already accounts for 45 per cent of the total cost of welfare, and at present trends, with the proportion of the old in the total population increasing annually, this could have grown by another thirty per cent by the end of the century. Needless to say these trends will be reversed long before then, but at a cost of terrible suffering to a lot of people.

Crèches for young children are also required in ever greater numbers as more and more women go out to work, and can no longer look after their own children. The educational system is being overstrained to accommodate increasing numbers of emotionally disturbed children, the products of unsatisfactory or broken homes. In many schools the teachers are more occupied in keeping order than in teaching. And in this task they are increasingly less successful. Indeed violence in schools is reaching unheard of levels, with more and more teachers being beaten up. It seems only a matter of time before rape and even murder of teachers will happen here, as it already does in the U.S.A.

An even greater police force, more and more lawyers, and ever more numerous and massive prisons are also required. In the U.S. expenditure on these institutions has now reached thirteen billion dollars; yet crime is increasing at an even greater rate, so much so in fact that it is now regarded in many cities as the principle social problem that America has to face, more important than inflation or unemployment.

One might well ask whether any of these institutions are indeed capable of solving the social problems they are designed to deal with. The answer is quite clearly no. Even if we could afford to pay for their continued expansion, one can say quite emphatically that they would not enable us to solve any real problems. All they can possibly do is *mask their symptoms and, by rendering them more tolerable, serve in this manner to perpetuate them.*

The old people's home is simply not a substitute for the family. In a stable self-regulating social system,

as Linton writes in *The Study of Man*, "The care of aged and infirm members is an almost universal function of family. There is no society in which the individual's connection with his family group is severed as soon as his usefulness to it is passed. Having given service the old are entitled to receive service in return."

Nor is the crèche a substitute for the environment a family provides, and the notion that the educational system can remedy any defects which might occur in the early stages of the socialisation process is indefensible on theoretical grounds and cannot in any case be maintained in the light of the massive empirical evidence to the contrary. Nor, quite clearly, can the police, the law courts and the prisons replace effective social controls.

Crime is no problem in a tribal or peasant society. Public opinion is far too powerful to permit deviations from the social norm. The fear of ridicule is often a sufficient deterrent. If this does not work a deviant will find himself boycotted, and will become a social outcast. Among other things, people will no longer come to his feasts — the worst possible insult — and if this is not effective he will be expelled from his community, which for a man in a tribal society is a fate worse than death.*

The disintegration of the family and community gives rise not only to a need for institutions, but also increases the demand for consumer goods and technological devices of all kinds, for if people live in extended family groups they have no need for washing machines, vacuum cleaners and the rest of the domestic gadgetry which is now regarded as a necessity of life in modern urban societies, because there are always enough members of the family around to fulfil the domestic chores. What is more they are unlikely to have been subjected to the industrial propaganda which, in our society, leads people to identify this sort of work with drudgery, and to regard it as more fulfilling to earn money working at an assembly line miles from home, in order to buy domestic appliances which will accomplish it for them. Nor do people living in extended family groups require more than a fraction of the houses and apartments, which even the richest industrial nation is today increasingly less capable of providing for all its citizens. Indeed in the U.K. it can be shown that the housing shortage has largely been caused by the dramatic fall in the number of people living in each house — from about ten at the beginning of the century, to two and a half at the present time — a trend which has by no means ended.

In conclusion, State Welfare is not a means of solving the social problems that face us today. On the contrary, by depriving the family and the community of its traditional responsibilities it is accelerating the process of social disintegration of which many of our problems — crime, delinquency, vandalism, drug addiction, alcoholism and so on — are but the symptom.

Edward Goldsmith

*It is interesting that as a society disintegrates, these controls become ever less effective. In Rome the most severe penalty was 'interdiction of fire and water', which deprived the citizen of religious and civic rights, and for all practical purposes forced him to leave the country. The death penalty existed but all citizens were free to take the option of leaving the country, which was considered tantamount to the death penalty. It is highly significant that as Roman society disintegrated these practices fell into abeyance. Under the Empire, interdiction by fire and water was replaced by two new types of banishment — 'deportation' and 'relegation' which involved seclusion in distant and disagreeable places, of which the worst was supposed to be Sardinia and an oasis in the Libyan desert. Thus exile was no longer enough — now it had to be exile to a disagreeable place. The next step could only be imprisonment, i.e. institutionalised punishment.

I would like to associate myself completely with the views expressed by Brian Johnson and Henryk Skolimowski in the July issue of *The Ecologist* on Population and Aid, and disagree completely with both the advertisement in the May issue by The Environmental Fund, called Statement on the Real Crisis Behind the 'Food Crisis', and the views expressed in Victor Gordon's 'Aid, the Arch Enemy' in the same issue. The views expressed by Victor Gordon are not only stupid, but a recipe for genocide — the Final Solution, as it were.

In the first place, who is responsible for the poverty in the Third World today? According to *The Cocoyoc Declaration* (1974), "Thirty years have passed since the United Nations Charter launched the efforts to establish a new International Order. Today that order has reached a critical turning point. Its hopes of creating a better life for the whole human family have been largely frustrated. On the contrary, more people are hungry, sick, shelterless and illiterate today than when the United Nations was first set up."

Why is poverty increasing in these countries? Again, according to *The Cocoyoc Declaration*, "Much of the world has not yet emerged from the historical consequences of almost five centuries of colonial control which concentrated economic power so overwhelmingly in the hands of a small group of nations. To this day, at least three quarters of the world's income, investment, services and almost all of the world's research are in the hands of one quarter of its people . . ."

After making allowances for corruption and inefficiency on the parts of some of their governments, whether military or civilian, it must be conceded that many of the Third World countries are still the victims of foreign exploitation. The exploitation is practised not through overt political control, but covertly, through industrialization entailing the transfer to these countries of foreign technologies which are inappropriate to their circumstances. The industrial machine is mainly in the hands of foreign companies, which are there solely for their own profit.

Western countries have in recent years taken more from Third World countries in profits, in interest on loans and capital repayments, and through advantages gained as a result of unequal price fixing, than they have given Third World countries in various aid schemes. It has been estimated that about 68 per cent of the aid and private investment funds from the rich industrialised countries to the Third World finds its way back to the donor country. All the aid and investment are only helping to make the rich richer and the poor poorer. Exploitation of the people in these countries continues as it did during the colonial era.

United States Senator Charles McMathias Jr. has said that "capital outflows from Latin America into the United States are now four times as great as the flow south. The countries of Latin America, in a way, are actually giving foreign aid to the United States, the wealthiest country in the world." Former President Richard Nixon of the United States, during his Presidential campaign in Ohio, in 1968, told his audience, "Let us remember, the main purpose of American aid is not to help other nations but to help ourselves." With the exception of Sweden, the Scandinavian countries and Holland, Western governments, either unilaterally or multilaterally through such instruments of credit as the World Bank and the International

Monetary Fund, can, and do, exercise control over their aid and investment policies from the most precise supervision to an ultimate veto on drastic initiatives by Third World countries to restructure their neo-colonial economies.

The point is simply this: that no-one in a position of power and prosperity can offer such aid as would threaten his own security. In a lot of ways aid has become a means of impoverishing and exploiting the recipient countries. The donor countries are getting richer while the recipient countries are getting poorer and poorer. *Aid has become the cure that kills.* Contrary to Mr. Gordon's view, thousands of people in the Third World are dying as a result of the useless aid they are getting; it is not aid that is keeping them alive.

For example, 'poverty' was almost unknown in pre-colonial Africa. There was no overpopulation in the sense of the rate of increase of population growing faster than the rate of increase of food production. The system of land tenure provided each family with the land required to feed its members. Each family also regarded it as its sacred duty to look after its members who were incapable of looking after themselves.

There was no unemployment or malnutrition. The changes initiated by colonial rule gave rise to poverty and overpopulation. As far as nutrition is concerned, the people who suffered most from specific nutritional deficiencies were those brought most fully into the colonial economy — the urban workers. Those who managed in spite of colonial rule to maintain their traditional pattern of nutrition are generally very healthy and resistant to disease.

Perhaps the most important problem engendered by many years of colonial control and exploitation is that community identity in Third World countries became the victim of the profit motive in the West. The destruction of localised community life is largely the product of the pursuit of profit; bigger industrial units and increased specialisation of labour spell bigger profits, and these objectives were pursued quite regardless of their ill effects on community life. It is here that the contemporary problems of poverty associated with many of the countries in the Third World have their origin.

The only way to overcome poverty in the Third World is for it to lessen its dependence on the rich countries and consciously to detach itself from the existing international economic and trading patterns and the so-called "world market", and pursue an independent and separate path of development, which takes cognizance of its own cultural, ecological and traditional realities. This in effect means that Third World countries need to develop on their own, to invest their traditional concepts with new meanings and not slavishly to accept the standards of the rich industrialised countries. Nor must they wait for a miracle to happen or for supernatural deliverance or foreign aid of dubious value. To quote Mr. Gordon, "Millions of our fellows ought to die as quickly as possible." For him, it would appear, death is the best answer to overpopulation. Although in the long run we are all dead, we should not die prematurely, as many do in the Third World, due to the aid given to them by many rich Western countries. Mr. Gordon should recognise this simple truth about the kind of aid which comes from his own country.

It is worth emphasising that many Third World countries are not as poor as most people would have us believe, nor is their need for aid as great as it is made out to be. The distinguished West Indian economist, Professor William Arthur Lewis, has argued, for instance, that Africa possesses everything it needs — space, resources, agricultural potential, people — and it lacks only certain skills and capital for development.

Presidents Julius Nyerere of Tanzania and Kaunda of Zambia, not satisfied with what is happening, have produced an alternative theory of development — self-reliance — which they have tried to put into practice. They have preached that aid as a catalyst is acceptable, but not acceptable when it does not form part of the development process. China, too, learning a bitter lesson after Russia withdrew all its technical assistance at the start of the 1960s, now emphasises that in every aspect of development it must be self-reliant, and in no scheme does it want to be dependent upon skills from outside, however tedious and tortuous this may make the development process.

The Nyerere and Kaunda approach emphasises that Third World countries will have to rely on themselves and their resources. The resources are land and people. Self-reliance does not mean that Third World countries will not need or accept international assistance for their development. Obviously they will need and seek foreign capital for particular projects. They would welcome such capital and assistance provided these catalyse their development, and if the capital and aid are related to the *actual needs* of the countries, and not the needs of the donor countries.

Perhaps the most impressive example of effective innovation on the basis of indigenous resources are the efforts of the peasants of China. I do not want to idealise China. The Chinese peasants do not of course run the country; the Communist Party leadership does that, in association with the leadership of the army. And there is much to be criticised in the way they do it — like the suppression of dissent, the harassment of

suspect non-Chinese minorities, and the use of forced labour.

However, on balance, I think the Chinese approach to the problems of poverty, economic backwardness and over-population has more to teach the people of other Third World countries than most of the literature on development and population control has conceded. The debate about population control has come at a time when it is necessary to re-evaluate the economic achievements of China. What has impressed me most about China since Mao Tse Tung came to power is her rejection of Western or Russian models of industrialisation as the only solution to the country's problems; her insistence that a large part of the country's industry should be located in the rural areas and that the people as a whole should be the beneficiaries of the new wealth which it creates; and the psychological drive to show the peasant that he can initiate development himself and that he need not limp along, supported by the twin crutches of outside expertise and aid.

These facts suggest that Chinese leaders are attempting something fundamentally new, in which the socialist and humanitarian traditions of China — human equality, co-operative effort, and the elimination of the barriers between town and country and between mental and manual work — are not only rhetoric, but are being taken seriously, as determinants of the direction of change as well as of its methods. I am well aware that the Chinese achievements cannot be simply copied by other Third World countries; they are of course the product of specific historical and cultural circumstances, and as China continues to develop, the prospects for the future are not without uncertainties. But her success to date in solving her problem of poverty and controlling her population presents an interesting alternative for other Third World countries, members of the Environment Fund and Mr. Gordon to think about.

Jimoh Omo-Fadaka



Ecologist Binders

Keep your Ecologist magazines in first class condition in our special easy reference binders.

Only £1.75 (\$ 5.00) each plus 20p (50c) postage.
(Indices included *FREE* in all volumes.)

Also complete your set of The Ecologist. All back numbers available except Vol. 1, 12 and 14 (out of print) and Vol. 1.11 and Vol. 2.5 which are rare and only available in complete issues as follows:

VOLUME 1 (16 issues) July 1970 — December 1971 £8.00 (\$20.80)
VOLUMES 2 & 3 (12 issues) 1972, 1973 £6.00 (\$15.60)
VOLUMES 4 & 5 (10 issues) 1974, 1975 £5.00 (\$13.00)
SINGLE BACK ISSUES £0.55 (\$1.40)

EXTRA INDICES 55p each.

Available from: The Ecologist, 73 Molesworth Street, Wadebridge, Cornwall.



Worldwatch Papers

WORLDWATCH PAPERS provide the most informative, clearly written and up-to-date summaries of the critical problems facing the world today. They are essential reading for all those involved in shaping public policy and all within the ecology movement who are desperately trying to force decision makers to face world realities.

1. The Other Energy Crisis-Firewood
Eric P. Eckholm.

Nine tenths of the people in poor countries today depend on firewood as their chief source of fuel. Massive population growth, however, and suicidal de-forestation have given rise to a critical firewood shortage.

Eric P. Eckholm, who has probably studied this tragic situation more carefully than anyone, points to its causes and implications.

2. The Politics and Responsibility of the North American Breadbasket. Lester R. Brown.

Six hundred million people depend for their sustenance on the import of U.S. and Canadian grain. Lester R. Brown, America's most knowledgeable and realistic authority on the world food situation, spells out the terrifying implications for this unprecedented situation.

3. Women in Politics — A Global Review.
Kathleen Newland.

4. Energy: the Case for Conservation
Denis Hayes.

A comprehensive guide to the principles of energy conservation in industry, agriculture, transport and the home.

5. Twenty-two Dimensions of the Population Problem.

Lester R. Brown
Patricia McGrath
Bruce Stokes.

The many consequences of the population explosion have either been grossly underrated or totally ignored. Lester R. Brown and his colleagues show how, and to what degree, it affects almost every aspect of our lives. An essential paper for those involved in the fight for population stabilisation.

6. Nuclear Power: The Fifth Horseman
Denis Hayes.

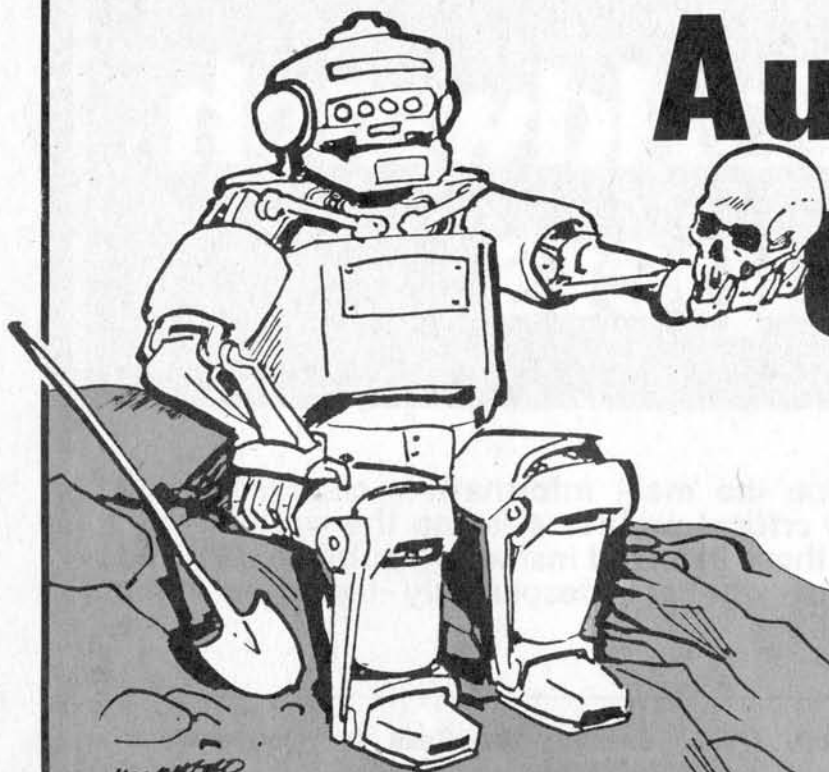
A brilliant summing-up of the evermore devastating case against nuclear power. This paper should be read by all those active in the fight against the Nukes.

Price £1.00 each post free from The
Ecologist, 73 Molesworth St., Wadebridge,
Cornwall PL27 7DS.

This important series of papers written by distinguished experts and published in booklet form by the Worldwatch Institute of Washington D.C. is now available to readers of The Ecologist through our agency.

Australian Uranium Politics

By Peter Springell



Hand-drawn

".... I knew him well"

WARNING:
URANIUM MINING
IS HAZARDOUS
TO YOUR HEALTH

YOUR GOVERNMENT WANTS YOU TO BE AWARE OF THE DANGERS OF SMOKING
SO IT REQUIRES THAT A WARNING COME WITH THE PRODUCT
YOUR GOVERNMENT DOES NOT WANT YOU TO BE AWARE OF THE DANGERS
OF URANIUM MINING. IT'S THE GOVERNMENT'S PRODUCT

Neither Governments nor multi-nationals are able to make up their minds whether it is more profitable to mine Australia's uranium now, or leave it in the ground. For this reason the environmentalists find themselves doing battle with an elusive enemy which counters expressions of moral concern with platitudes and half promises, designed to leave them free to exploit the land, and the people who live on it, should they decide to.

The fight to keep uranium in the ground has emerged as number one environmental issue in Australia. The stakes for both sides are considerable. Recoverable reserves of some 240,000 tons at less than US \$1500 per pound uranium oxide (U_3O_8) represent almost a quarter of the known reserves of the western world.¹ In terms of uncommitted supplies, that proportion is considerably higher.

Financial Considerations

There would seem to be easy pickings to be made by the multi-national mining cartels. Some of the deposits they have cornered in the so-called Uranium Province of the Northern Territory east of Darwin, are described as the richest in the world.² While the bulk of the enormous profits would naturally go overseas, there would seem to be enough crumbs left over for the Australian Government to be interested in making a very handsome killing just in terms of royalties, etc.

However, there is just one snag. It is well known that there is simply not enough uranium around to fuel a nuclear power programme based only on conventional nuclear power stations³. This is because natural U only contains 0.7 per cent of the U-235 usable in present-day reactors. On the other hand, if the breeder reactor, which is fuelled by U-238, were to be developed, then the remaining 99.3 per cent of the mined uranium would immediately become available for power generation. It would seem then that the entire future of the nuclear power generation programme hinges on the successful development of the breeder reactor.

The uranium miners must soon make up their minds when to sell. If the breeder is not developed then they would be wise to either leave the deposits in the ground, or stockpile the yellowcake on the surface until the uranium shortage becomes so acute that prices will be astronomical. However, if the breeder does become a reality, then they had better sell quickly, because otherwise there will be an enormous surplus of natural uranium, and the bottom will fall right out of the market.

Enrichment Problems

The situation is even more tricky with regard to uranium enrichment. Conventional nuclear power plants need to have the U-235 content of their uranium fuel upgraded from 0.7 to 3.2 per cent. However, the enrichment technology is in a state of great uncertainty at the moment. While the old gas diffusion process now seems to be out of favour on economic grounds, the more recent centrifugal process could also become obsolete as a result of new developments in laser technology. Furthermore, the advent of the breeder reactor would put the very costly enrichment plants out of business almost over-night. On the other hand, there is going to be a very real shortage of enrichment facility, if the breeder does not materialize. So there again prospects are for either vast profits or devastating losses in the enrichment enterprise.

It is thus amusing to see multi-nationals and Governments walking the tight-rope, with nobody quite certain what to do for the best. Environmentalists themselves are therefore uncertain how seriously to take proposals for uranium enrichment plants in Australia. One has been mooted near Port Augusta, at the northern end of Spencer Gulf in South Australia, and the other near Rockhampton in Central coastal Queensland. At present, the South Australian site appears to be favoured for rather obscure political reasons. The Rockhampton site would probably be better from the purely technical angle, because of availability of fresh water and abundance of coal supplies, but environmentally it would be less desirable because of its proximity to the Great Barrier Reef.

Ranger Uranium Inquiry

In the climate of uncertainty, it obviously made sense for the Australian Government to procrastinate, for a while at least. Indeed there was even considerable political mileage to be gained by

appearing to appease environmentalists. So it happened that the former Whitlam Labor Government asked one of several mining companies (Ranger Uranium Mines Pty. Ltd.) with rich uranium leases at Jabiru, some 140 miles east of Darwin, to prepare an environmental impact statement covering its proposed mining operations. A glossy document of some bulk was completed in February 1974⁴ to be followed by a slimmer supplement in May 1975.⁵

Obviously the then Labor Government was in no great hurry to make a decision. The Minister for Minerals and Energy of the day, Cdr. Rex Connor, was initially fairly confident of getting the go-ahead to mine, should he deem it desirable. Indeed, Labor Party policy⁶ was favourable to such a course. However, opposition to uranium mining was mounting within his own Party, and within the Trade Unions.

It became clear that an embarrassing split could develop at a time when the Government's popularity was already rapidly dwindling because of rising inflation and unemployment.

It was under these circumstances that the environmental impact statements were eventually made public in July 1975. Comments were invited from interested parties, together with an option to appear before an Inquiry, which was to be conducted by Mr. Justice Fox.

The Inquiry itself opened in Sydney in September 1975. It has since sat in most of the State capital cities, and in Canberra and Darwin. It soon became obvious however, that the scope of the Inquiry would have to be very much wider than the subject matter covered by the environmental impact statement itself. The proponents were largely concerned with technicalities of what happened within the confines of the mining lease, whereas the majority of objectors were concerned with the surrounding environment, the effect on the local aboriginal population, and particularly with the wider global implications of the uranium technology in general.

Change of Government

In the meantime, the multi-national mining companies were realizing that the resolve of the Labor Government to allow sales of uranium, if called upon to do so, was weakening because of the turn of events within the Labor Party, and by the way the Ranger Uranium Inquiry was going. By November 1975 it was time to call in the

CIA, and change the Government⁷.

The Ranger Uranium Inquiry had gone too far by the time there was a change of Government, and it proved politically too difficult to stop. In fact, an attempt by Prime Minister Fraser to prematurely terminate the Inquiry by 30th June, 1976 was met by a rebuff from Mr. Justice Fox. So the new Government must now await the outcome of the Inquiry, and it may have to do so a lot longer than it bargained for. An interim Report, which was to have been out by the end of August has been delayed by at least a month, while the final Report, could be a year or more in the offing.

Leaked Documents

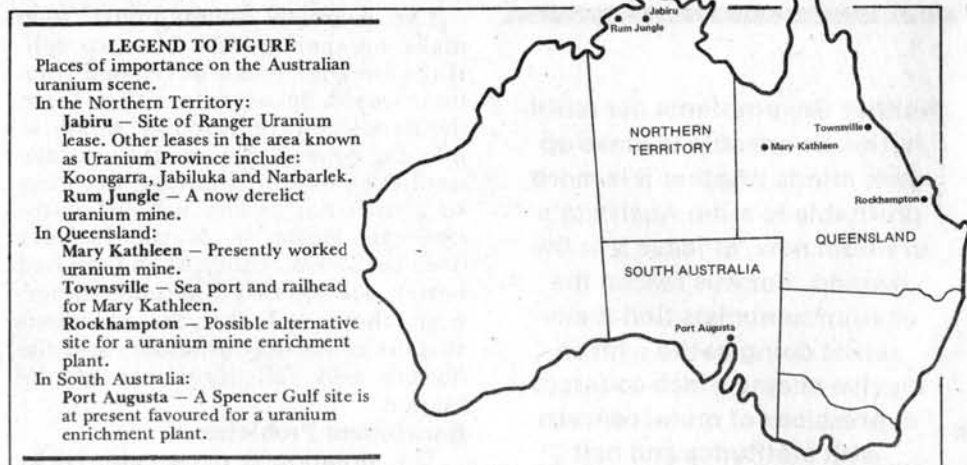
Friends of the Earth (FOE), who have spear-headed the Australian anti-uranium campaign, anonymously received copies of hundreds of pages from the not-so-secret files of Mary Kathleen^{7a}. The material contained therein is still a very closely guarded secret, which the nuclear industry would dearly love to lay its hands on. Indeed FOE is understood to have been approached by at least one large enterprise wanting to buy information from them. The authenticity of the bits made public so far has not been questioned.

The leak took place early in August, and so unfortunately after all the final submissions to the Ranger Uranium Inquiry had been heard. FOE passed the documents over to the Inquiry, but they were inadmissible on grounds which are somewhat uncertain. There are conflicting reports that the reason was the late tendering of evidence, or alternatively, that the information was not relevant. The latter explanation is not very plausible, since it revealed, among other things, the industry's private anxiety about waste disposal and the possibility of terrorists acquiring nuclear weapons, a point which they had publicly denied at the Inquiry.

Price Fixing Cartel

Perhaps the most important document yet to surface from the documents is the revelation of an international price-fixing uranium cartel, which was formed in Australia in February 1972. The full details of this are now in the safe hands of the US Justice Department.

The cartel is said to be composed of 97-98% of non-US uranium suppliers, and includes those from Australia, Canada, France and South Africa. The effectiveness of the cartel may be gauged from the fact that uranium prices had jumped 700% since its inception. If the cartel



is smashed, as seems likely, then uranium mining in Australia and elsewhere, could well become a much less rewarding exercise.

Resource Diplomacy

The new conservative Government has a bulky, if unconvincing, environmental policy, full of platitudes and escape clauses⁸. The most significant in the latter category, is a means by which the Government can override environmental considerations on grounds of "national interest". Consequently, the Government cannot lose. If the Inquiry gives a go-ahead for mining, then the Government can claim that it had given environmentalists a fair hearing. If on the other hand mining is obstructed in some way, then some grounds will be found why it is in the national interest to mine uranium.

The new Minister for National Resources, Mr. Doug Anthony, has for months been working on the assumption that a pro-mining decision was already a foregone conclusion. The power-hungry Japanese have been assured they can have Australian uranium come what may. Australians are being told that if they try and stop Japan from having the uranium, then surely she will come and get it. So, it will very obviously be in the national interest that Japan be given the uranium she is asking for.

In actual fact, Mr. Anthony is having considerable difficulty in unloading Australian uranium in Japan⁹. He naturally wants to clinch long-term contracts in case the breeder reactor appears on the scene, but Japan just as obviously does not want to be bound to take expensive uranium which might become dirt cheap before the expiration of the contract.

Similarly, on the enrichment front, there are some extraordinary gymnastics afoot. The Australian Prime Minister recently strongly

attacked Russia in connection with an alleged build-up of Soviet naval strength in the Indian Ocean, mainly to help the Pentagon get its base at Diego Garcia. This outburst was however closely followed by a visit of Deputy Prime Minister Anthony to Moscow, with a brief, supposedly at Russia's request, to negotiate enrichment of Australian uranium by the Soviets. It is strange that the possibility of Russian ships in the Indian Ocean having nuclear warheads made of Australian uranium had evidently never occurred to the Government.

The Government's attitude would appear to be in the best Australian tradition. Not so long ago, there were complaints of French nuclear fall-out in Australia from Pacific tests in which some of the uranium was rumoured to have been of Australian origin.

Trade Union Involvement

Australia had engaged in uranium mining in the late 50's and early 60's at Rum Jungle, and at Radium Hill in South Australia, west of Broken Hill. Subsequently when the uranium there was mined out, activities moved to Mary Kathleen in North West Queensland. In 1963 this mine was closed temporarily when a profit-motivated decision was made by the multinationals to buy Canadian rather than Australian uranium. With customary disregard for the livelihood of the work force, this was done at a time when contracts had not yet expired.

The duplicity of the former Labor Government is evident from the fact that it allowed Mary Kathleen to gear up for renewed uranium mining at a time when the Ranger Uranium Inquiry started to get under way. At that time the Government was still trying to pretend that the Inquiry would only be concerned with environmental considerations in the immediate vicinity of Jabiru. This pretence found little favour with Trade Unions

who were by then becoming apprehensive about the wider implications of uranium. In an effort to appease the unions, an outspoken pro-uranium right-wing union leader was given a Directorship in the Company.

The Trade Union movement is by no means unanimous in its condemnation of uranium mining and export. Indeed, not surprisingly, the unionists who mine the Mary Kathleen field are all for mining. By contrast, the Australian Railways Union has spearheaded the opposition to mining, as well as export. Matters came to a head when in May 1976 unionists in Townsville, North Queensland, refused to load sulphur into waggons destined for Mary Kathleen. The dispute, which precipitated a national stoppage of trains, led to a compromise arrangement, whereby mining would be allowed to continue, but no yellowcake would be allowed to leave the country until after the outcome of the Fox Inquiry.

The solvency of Mary Kathleen Mines is now seriously in doubt, unless the Australian Government again steps in. Millions of Australian tax-payers' money was spent re-opening the mine, and yet the company finds itself in the position where it cannot guarantee delivery of its own uranium to customers. To meet immediate commitments, arrangements had to be made to "borrow" yellowcake from the U.K. Even if the export of yellowcake is eventually sanctioned, the delay will certainly prove to be a very costly one to the company. The incident will also help to sow seeds of doubt as to Australia's reliability as a dependable source of uranium.

There is now also no certainty that all the unions will necessarily feel bound by the outcome of the Ranger Uranium Inquiry. It may well be that if the reasons for allowing mining were to be unconvincing, or if the Australian Government were to try to overcome an adverse decision by devious means, then a uranium export ban may well remain in force.

The Trade Union movement seems poised to confront the non-Labor Government over a number of other issues, including the National Health Scheme (Medibank). It is possible that an issue such as uranium, which after all would not put too many jobs in jeopardy, could become a popular cause on which to challenge the Government.

Environmentalists are also hopeful that they can persuade unionists to retain the ban on mining, even in the event of an adverse decision by

the Ranger Uranium Inquiry. It is argued that the large amount of material uncovered by the Inquiry should be the start, rather than the finish, of a more informed public debate. Furthermore, the Government, which spent much public money helping the mining case through the activities of the Australian Energy Commission, should now make an equal monetary contribution to bringing environmental arguments to the notice of the public.

Aboriginal Land Rights

The uranium mining issue has impinged on aboriginal land rights, and on proposed National Park boundaries. The Narbarlek lease, also in the Uranium Province, happens to be right next to the sacred dreaming place of the Green Ants. Indeed, mining at Narbarlek has been likened to putting an oil well right in front of St. Peter's in Rome.

Exploitation of Uranium would of course not be the first time the white man has found it necessary to push the aborigines off a piece of ground for profit. The whole history of white settlement in Australia must ultimately fall into this category. The question is whether monetary compensation, which is all mining companies ever seem capable of offering in minimal quantities, is at all appropriate. It could well simply aggravate an already serious alcohol problem among dispossessed aborigines of the Northern Territory.

Social disruption also results from a mining company moving into tribal land. The miners claim that they raise the standard of living of the aborigines by giving them high wages. Sudden affluence breeds materialism, which is basically alien to aboriginal culture. Even if they were eventually to adapt, mining operations are notoriously ephemeral. No one seems to care what is to happen to the aborigines when the mines close, as they inevitably must.

National Park Proposals

The miners are not only seeking access to land within aboriginal reserves, but they would also be destroying one of the few remaining wilderness areas in the so called Top End of the Northern Territory.

The Northern Territory Reserves Board drew up plans for the Kakadu National Park back in 1965¹⁰, before the uranium rush. The Ranger Uranium lease is well inside the original boundaries. It makes interesting reading of how the Park boundaries were being gradually moved further and further as more and more uranium was being dis-

covered. Even under the previous Labour Government, which gave the impression of being sympathetic to Park proposals, no declaration was in fact made. If the Ranger Inquiry opts for mining, then the boundaries will presumably be moved again to accommodate prospective uranium miners. The whole idea of a Kakadu National Park may well be doomed.

Moral Issues

At the Inquiry environmentalists placed much emphasis on the now well known arguments surrounding nuclear waste disposal¹¹, the dangers of breeder reactors¹², the possibility of sabotage¹³, the energetic doubts¹⁴, etc., as well as on local issues such as worker safety, likely environmental damage to the surrounding countryside, etc. The proponents also reacted in a predictable manner.

The Inquiry was left in no doubt that Australia really faces a moral decision on uranium. If she were to opt for leaving the uranium in the ground, then perhaps other uranium-supplying countries could be persuaded to re-examine their position. Perhaps this would be the only way in which the type of scenario envisaged by the Club of Rome¹⁵ could be avoided.

If Australia's object is merely to make some money out of the deal regardless of the morality of it, then why not go in for exporting drugs in a big way? It would be a much better proposition in the long run, since she would at least be dealing with a renewable resource.

References

- (1) Cameron, J. & Hansen, M.V. (1976). Uranium resources and supply. *International Atomic Energy Agency Bulletin* 18 (1): 12-18.
- (2) Australian Conservation Foundation (1975). "Uranium. Metal of menace." (AFC:Melbourne).
- (3) Kenward, M. (1976). How much uranium? *New Scientist* 69 (993): 686-687.
- (4) Ranger Uranium Mines Pty. Ltd. (1974). Environmental Impact Statement, February.
- (5) Ranger Uranium Mines Pty. Ltd. (1975). Supplements No. 1 & No. 2 to accompany EIS of February 1974, May.
- (6) Australian Labor Party (1973). Platform, Constitution and Rules. 30th Federal Conference, Surfers Paradise, P.20.
- (7) Anon. (1975). Atom prognosis. *National Times*, 24-29 November.
- (7a) Stannard, B. (1976). A radioactive 'leak'. *National Times* 16-21 August.
- (8) Liberal & National Country Parties (1975). Environment & Conservation Policy, November, Section 4, item 1.
- (9) Anthony, J.D. (1976). Visit to Japan of Deputy Prime Minister. Ministerial Statement. *Hansard* (House of Representatives) p. 267, 25 February.
- (10) Northern Territory Reserve Board (1972). Notes on a proposal for a National Park in the Alligator River area of the Far North of the Northern Territory.
- (11) Lovins, A.B. & Price, J.H. (1975). "Non-nuclear futures: The case for an ethical energy strategy". (Ballinger Publishing Co.: Cambridge, Mass).
- (12) Tinker, J. (1973) Breeders: Risks man dare not run. *New Scientist* 57 (835): 473-475.
- (13) Kenward, M. (1974). Perils of the hijacked atom. *New Scientist* 62 (894): 106-107.
- (14) Chapman, P. (1974). The ins and outs of nuclear power. *New Scientist* 64 - (928): 866-869.
- (15) Mesarovic, M. & Pestel, E. (1975). "Mankind at the turning point". 2nd Report to the Club of Rome. (Hutchinson: London). Chapter 10; Faustian bargain: The ultimate technological fix. p. 130-142.

How The Enga

Responses to Climatic Perturbations in

by Eric Waddell

During 1972 the Central Highlands of Papua New Guinea experienced a prolonged drought that generated a long series of frosts causing substantial damage to both the food gardens of the local population and the natural vegetation. Official response to this crisis was to declare a national emergency and mount a Famine Relief Programme. While the relief exercise could not be faulted, the assumptions that underlay it were of questionable validity. A fundamental premise was that the victims had no satisfactory means of their own with which to overcome the results of the frosts. In this paper Professor Waddell shows how, in fact, the entire life-style of the Enga is perfectly designed to enable them to cope with the climatic hazards that they are likely to encounter in their homelands.

For most Enga — the people principally involved in the 1972 frost crisis — frost is a fact of life. Indeed, it provides the key to understanding the most distinctive element of their adaptive strategy, agricultural mounding.

The Enga number about 150,000 and are located to the west of the Mount Hagen range in the Western Highlands District (Fig. 1). They are concentrated principally in the Lagaip and Lai valleys in the vicinity of Wapenamanda, Wabag, and Laiagam government stations, but are also more widely distributed through the surrounding valleys and uplands over an altitudinal range of about 1600m, from 1100 to 2700m MSL. Their 'mean level of settlement' is unusually high for major New Guinea Highlands populations, being 1900m compared with about 1700m among the Chimbu.

As is widely recognised, the Enga cultivate their staple food, the sweet potato [*Ipomoea batatas*], and at

higher altitudes most domestic crops, in large mulch mounds that average in the Middle Lai valley about 3.18m in diameter and 0.6m in height.¹ These mounds are designed to protect highly vulnerable crops from the particular type of frosts that are experienced in the Central Highlands, namely radiation frosts. These occur on clear, still nights when outgoing radiation is excessive, and they are characterised by a marked inversion in the temperature regime close to the ground surface. Not surprisingly they are restricted to the dry season in the highlands, and the inversions are generally of a moderate order. Thus recordings made at about 2650m in the Sirunki area indicate that when temperatures in a

1. The following discussion of the functional significance of sweet potato mounding represents a summary of the material presented in Waddell (1972) in the section dealing with "land use techniques in response to environmental constraints" (pp. 138-168). The same source contains a detailed discussion of the Enga agricultural system as well as a comparative analysis of the agricultural practices of other highland populations.

Stevenson screen fall to 5.5°C there is a slight risk of ground frost, while below 4.4°C the likelihood is very strong. Under such conditions, the mound serves to modify to a significant degree the microclimate regime of cultivated areas by both elevating the sweet potato plants above the zone of lowest temperature and facilitating the drainage of dense, cold air downslope. Thus planting is concentrated in the upper part of the mound, while the whole mound surface and the 'channels' between are clean-weeded. The experimental work carried out at Sirunki indicates that, under conditions of high frost risk, minimum temperature readings on cleared, unmounded ground are of the order of 2°C lower than those on the upper part of the mound. Mulching further contributes to protecting the food plants from frost damage in that the heat generated by its decomposition raises soil temperature by about 1.2°C.

One striking confirmation of the functional significance of mounding

Cope with Frost:

the Central Highlands of New Guinea

Reprinted from *Human Ecology*, Vol. 3 No. 4.



Sweet potatoes planted in large mulched mounds.

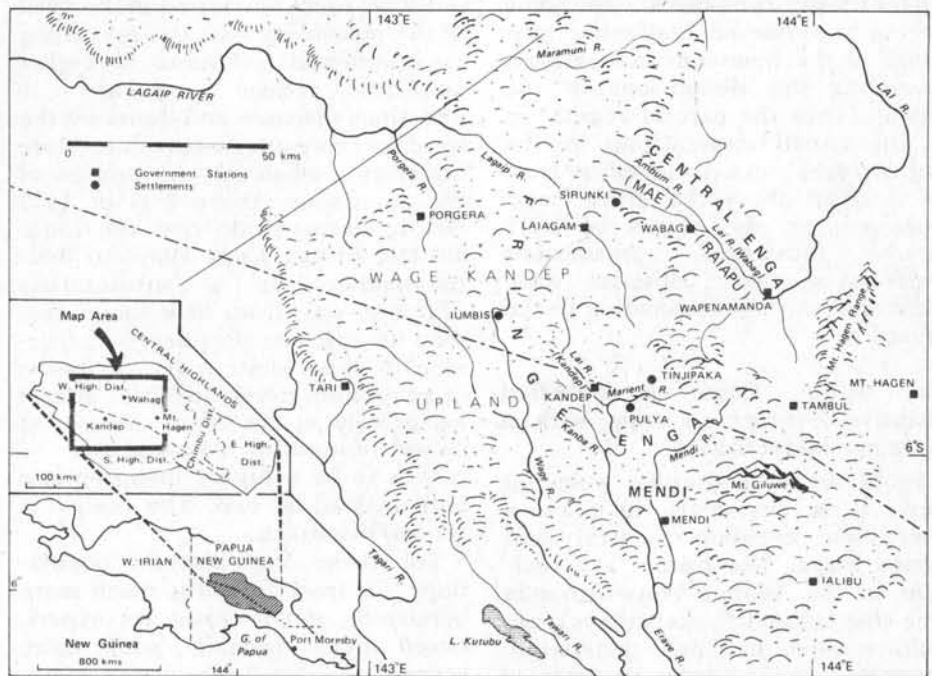


Fig. 1. Enga Territory.

is that the distribution of this practice through the highlands coincides with the distribution of the frost hazard. The Enga only mound above 1520m. Below that altitude they practise casual mixed gardening where the staple is intercultivated with subsidiary crops. More generally, as Brookfield (1962: 250) notes, mounding is restricted within the highlands to an area centring on the Wage-Kandep upland and forming an extensive area of unbroken country and broad valley flats at altitudes in excess of 1825m. Here topography, elevation, and a relative absence of cloud cover together actively encourage the concentration of cold air on agricultural land.

A phenomenon which is perhaps even more remarkable in the case of the Enga is the fact that certain main attributes of the mound vary in relation to the intensity and frequency of the frost hazard. Generally speaking, the gravity of the hazard increases with altitude. Mound dim-

ensions, minimum height above the ground at which the sweet potato vines are planted, and the degree of tillage of the soil similarly vary largely with altitude. A survey and classification according to similarity analysis of a large number of mounds through the Lai valley indicated the following. There is a general increase in mound height with altitude, from 0.55m at 1864m through 0.79m at 2079m to 0.85m at 2657m, although dimensions are considerably modified by slope of the ground surface to the extent that mounds on steeply sloping ground at high altitudes do not differ significantly from those at low. This presumably reflects the fact that conditions do not facilitate the settling of cold air. Minimum vine height varies much in the way that overall dimensions of the mound do, averaging 0.24m above the ground surface at 1864m and rising to 0.64m at 2657m. Indeed, the entire arrangement of planting changes. Thus at lower altitudes, vines are planted

over the whole upper surface of the mound, but above about 2400m a technique termed *moró* is used. Here the vines are arranged concentrically in such a way that tubers develop only within the circles and therefore at the very top of the mound. Both modifications are made in recognition of the fact that 'ice' will destroy the sweet potato if it is planted too close to the ground surface. Finally, while at lower altitudes the soil is worked into a fine tilth, the upper zone of settlement mounds are formed from coarse clods of earth which are then simply covered with a finer soil. This practice presumably serves, at least incidentally, to produce a soil which is less well aerated, therefore reducing the likelihood of significant fluctuations in surface temperature at altitudes where even slight variations might be critical to plant growth.

Mounding serves, then, as an effective adjustment to mild inversion frosts such as occur when screen

temperatures drop to around freezing point. For the Central Enga (Mae and Raiapu) resident in the Syaka and Middle and Upper Lai valleys it is an entirely satisfactory means of coping with the hazard. At higher altitudes, however, frosts are occasionally much more intense, as well as being more persistent. During the recent series, for instance, in excess of 25 nights of ground frost² were experienced at Iumbis in the Upper Wage valley (about 2620m) and the lowest recorded screen temperature was -2.3°C .

Under these conditions, mounding *per se* is rendered ineffective, the depth of the inversion frost greatly exceeding the dimensions of the mound. Thus the natural vegetation of the broad depressions in the Kandep area, was damaged by frost up to 100m above the valley floor. However, as the events of 1972 clearly illustrated, populations resident at these altitudes have additional ways of responding to the hazard.

The Fringe Enga: A modified adaptive strategy to cope with a more persistent hazard.

From an ethnographic point of view, it is customary to draw a distinction between Central and Fringe Enga. The former are resident in the Wabag-Wapenamanda area (the Lai and Syaka valleys), are characterised by high population densities, and conform to what is generally recognised to be the New Guinea 'norm' in that they can be viewed as comprised of a large number of locally organised populations — small discrete groups having intimate and exclusive relations with their immediate environment. They reside between about 1500 and 2200m on dissected terrain and therefore experience only the occasional, mild frosts that are coped with in the manner described above, i.e., entirely within the bounds of their group territories. The Fringe Enga live, for the most part, at much higher altitudes (2300-2700m) in the broader valleys of the Marient, Lai (Kandep), Wage, and Lagaip, centring on the government stations of Kandep and Laiagam. And conventional wisdom has it that they are for the most part simply refugees from the Central Enga: hapless individuals who eke out a miserable existence in a hostile environment.³ That is, they live in essentially the same way as the Central Enga but much less success-

fully on account of the severity of the frost hazard. This view has been developed principally in the writings of the anthropologist M. J. Meggitt and subsequently reinforced by government officers (public health and agricultural officers) concerned with the area. While some of their observations, e.g., regarding Central Enga origin and inferior nutrition, are undoubtedly correct, the interpretations given tend to be highly ethnocentric (to the Central Enga) and therefore misleading. Thus at one level, Fringe Enga nutrition must be viewed in the light of the possibility that the prevailing environmental conditions at higher altitudes reduce exposure to infectious diseases and therefore the need for more ample nutrition. More important, whatever the origins of the population, the events of 1972 clearly demonstrate that the high-altitude Fringe Enga adapt to their environment in a substantially different way from how their kinsmen do at lower altitudes. In particular, in terms of strategy, the notion of adaptation being achieved almost exclusively at the local level — of closed corporate communities — proves to be a highly inappropriate and misleading one. The reality is far more complex.

For these high-altitude populations, the frost hazard is much more persistent; minor frosts are experienced almost annually, while more serious, killing frosts occur every one to three decades. It is possible in turn to identify three distinct levels of coping with the problem — levels that may be called local, intra-regional, and extraregional. The first refers to the strategy adopted within the boundaries of the group territory; the second refers to that within the immediate region, i.e., an area which shares similar ecological and particularly altitudinal characteristics; the third refers to the exploitation of resources at some distance from the local group territory and in a much more favourable ecological context, where the frost hazard is non-existent.

The Local Level

The fringe population of the Kandep area (Marient, Lai, and Wage valleys) practise mounding as their exclusive method of cultivation. In this respect, they distinguish themselves markedly from the Raiapu (Central Enga), who have

3. Meggitt (1972: 117) writes, for instance, that the Kandep was "until the recent construction of roads little more than a vast series of cold swamps at about 7,500 ft. (2312 m.) above sea level, punctuated by drier hillocks on which small communities huddled and grew inferior sweet potatoes."

three types of gardens, only one of which is mounded. Further, virtually all food crops are planted on the mound, their actual arrangement over the surface reflecting variations in frost tolerance. Thus sweet potatoes are arranged concentrically around the top while the more quickly maturing and slightly frost-tolerant 'Irish' potatoes [*Solanum tuberosum*] that have been introduced within the past 20 years or so are planted (or simply spring up) randomly over the whole surface. Similarly, other recent plant introductions with a moderate to high resistance to frost, such as peas [*Pisum sativum*], beans [*Phaseolus vulgaris*], and cabbage [*Brassica oleracea*], are confined to the lower parts of the mound below the circle of sweet potato vines. In this way, maximum advantage is derived from the cultivated area given the constraints under which agriculture is practised.

In addition to this particular variation in cultivation techniques, gardens are generally maintained in two ecological niches. Within each group territory, there are two major terrain units of agricultural significance, the valley bottoms and the lower slopes of the dividing ranges, with settlement being concentrated along the margins of the two. The bottom lands are typically under grass while the slopes are under primary and secondary growth that is progressively being converted into grassland as a result of clearing for cultivation. From the point of view of agricultural productivity, it is the former that are preferred, the soil being more fertile and having less tendency to dry out. The land is in turn cultivated much more intensively, fallow periods being limited to 1 or 2 years' duration. Nevertheless, one serious disadvantage arises from the location of gardens in the bottom lands — they are very vulnerable to frost. Hence, while the vast majority of gardens are concentrated in the depressions, many households have one or two on the slopes. Here, elevation above the valley bottom, improved air drainage, and the shielding effect of the surrounding forest together significantly reduce the gravity of the hazard. These latter gardens, while mounded, are cultivated on a somewhat different cycle. There are sometimes two successive plantings, with emphasis in the first being placed on various minor greens [*Rorippa* sp., *Brassica* ? *campestris*, etc.) and in the second on the staple, sweet potato. In both, taro [*Colocasia*

2. Calculated on the assumption that ground frosts were experienced whenever screen temperatures fell below 4.4°C .

esculenta] is an important subsidiary crop. Thereafter, the gardens are abandoned more or less permanently apparently because production falls off very rapidly. Since they are initially cleared from forest, this practice facilitates the progressive upward shift of the forest-grassland boundary.

This spatial arrangement of agricultural activity enables the population to cope with the minor killing frosts that are experienced every few years, because even though serious damage may be incurred in the depressions the slope gardens are left more or less unaffected. Thus in addition to food being continuously available there is, more importantly in the long run, a readily available source of planting materials, allowing recultivation of the damaged gardens to commence immediately.

Further, in addition to these long-term measures, a few people take preventive action immediately prior to an expected frost. A few mounds may be covered with grass or other plant material, all but the very tip of newly planted vines may be temporarily covered with earth, or the grassland in the centre of the broad depressions may be set on fire. However, no one views these as satisfactory alternatives to serious agricultural planning. And here, because of the possibility of serious frosts occurring that will do massive destruction to foods and planting materials in both niches at the local level, most households are concerned with maintaining access to resources located at considerable distances beyond the boundaries of their particular group territories.

The Intraregional Level

Many members of each local group exercise outright and/or usufruct rights to land in two separate locations that may be as much as one day's walk from each other but still within the confines of the high frost-risk area, i.e., within the same or adjacent valleys and at similar altitudes. Usufruct rights are obtained to land of affines and normally maintained by death compensation payments, while outright access reflects the fact that many clan territories are geographically fragmented. Thus those belonging to the Aimbirepe and Agulya phratries control land on both sides of the Marient basin, while members of Ku and Molopai, principally situated at the head of the Lai (Kandep), also have territory in the Upper and Middle Wage valley. In 1973, at least one-third of the

members of Wesanda (at Tinjipaka in the Marient) and Bipe clans (at Iumbis in the Wage) were maintaining access to non-local land in this manner. On account of it, two houses are generally maintained and a great deal of time is spent in moving between the two locations in connection with garden work. However, under 'normal' conditions, gardens are not necessarily maintained in both areas.

Whatever the explanation for this territorial 'splitting' at the clan level and parallel partial separation in



Sweet potato vines being carried into the Marient from the Upper Mendi Valley.

agricultural activity, it makes good sense ecologically in spite of the fact that the frost hazard is uniformly high throughout the region. While there is little empirical evidence to support the fact, it is clear that severe frosts do have a variable impact; altitude is not the only factor determining their gravity. Both their intensity and duration are influenced by topographical considerations of slope and aspect, the one affecting the movement and accumulation of cold air and the other determining how long a given area is protected from the direct rays of the morning sun. In the case of the first, the flow of dense air is strongly influenced by watercourses which facilitate its concentration as it moves downslope, and by low ridges which permit movement from one valley to another. As far as aspect is concerned, nocturnal frosts probably persist longer on westward-facing slopes as a result of their being in the shade for half an hour or more after sunrise. Such minor intraregional variations as these may be of critical significance

for plant growth under conditions in which temperatures drop only marginally below freezing and are of limited duration. Within a single altitudinal zone, serious damage may be inflicted on gardens in one locality while those in another remain largely untouched. Householders thus have every reason to maintain widely separated agricultural holdings.

Even in the case of total loss of food crops, this geographical separation often makes good sense. Given that most crops are vegetatively planted, in the long run it is the lack of planting materials which is the gravest problem the affected populations have to face. Failure to start re-establishing gardens immediately can mean extending the crisis by several months if not indeed also intensifying it. Thus, while the sweet potato tubers continue to be available for 1-2 months following killing frosts, the growing plants themselves are permanently affected.⁴ In the circumstances, proximity to unaffected areas outside the region which could serve as alternative sources of planting materials becomes critical. In general, the maximum carrying distance for sweet potato vines is one day's walk. This is because unless well protected by grass, they dry out very quickly and many are lost. More important, they are bulky, and an adult is unlikely to be able to carry more than enough to plant three or four mounds. However, not all the high-altitude zone is immediately adjacent to areas unaffected by intense frosts. For instance, Tinjipaka, on the northern side of the Marient, is at least two days' walk from the Syaka valley, an area that does not experience severe frosts. On the other hand, the other section of Wesanda clan's territory, at Pulya in the south-west corner of the basin, is within a day's walk of the Upper Mendi and Kanba valleys, both major sources of vines in the event of widespread killing frosts. Thus, on such occasions, many clansmen simply move to that part of their territory situated closest to the source of vines and commence replanting there. Significantly, all adults regardless of sex participate actively in the task.

4. In a survey carried out through the Kandep area immediately following the killing frosts of October 1972, informants repeatedly made statements similar to the following (in Pidgin English): "olsem mipela kisim inap kaihai nau, tasol taim bilong ol pipel i dai long hangri ino yet. Dispela taim nau ino taim bilong ol pipel i dai. Taim bilong pipel i dai ino kam yet" (Lacey, n.d.:1). ("We nevertheless get enough sweet potatoes at present; this isn't yet the time when people die from starvation. Now isn't the time when people die. The time when people die hasn't come yet.")

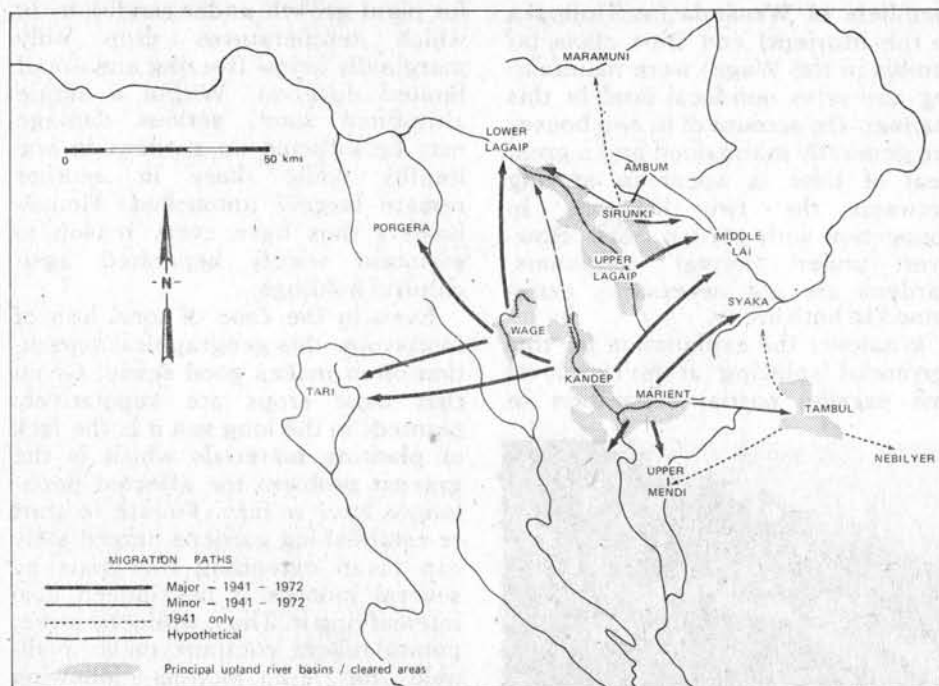


Fig. 2. Migration Routes, 1941 and 1972.

Six months or so later, as these new gardens approach maturity, vines are taken from them to the more remote territorial segment to initiate replanting there. The only alternative to this process of progressive reoccupation of the high-altitude areas is simply to wait until regrowth occurs in the damaged gardens. This is not always certain and involves extended dependence on an alternative supply of food.

In the event of extensive killing frosts, widely displaced clan-holdings certainly facilitate rapid re-establishment of food gardens. However, there are inevitably several months when no major foodstuffs are available and an even longer period when they are in short supply by virtue of the time taken to replant with vines carried in exclusively by foot. Furthermore, at these high elevations, the sweet potato takes at least nine months to mature. In the circumstances, more direct recourse to extraregional resources is dictated, and this takes the form of out-migration.

The Extraregional Level

On at least three occasions within living memory (in the early 1920s, in 1941, and again in 1972), a long series of frosts resulted in the massive movement of population down to lower altitudes. Entire families, together with their livestock, sought refuge in valleys sometimes situated as much as 7 days' walk away across the mountains, namely, in the Syaka and Lai (Wabag), the Ambum, Maramuni, and the Lower Lagaip valleys, and

in the Porgera, Tari, Mendi, and Tambul areas (Fig. 2). While such out-migration represented, for those involved, a final recourse, resorted to only some time after the certain destruction of food gardens, it was in no sense unplanned or haphazard.

The procedure on the first two occasions was, as repeated frosts resulted in increasing crop losses, to slaughter progressively most of the domestic pigs. This served both to reduce the demand for available resources (because pigs are partially dependent on cultivated foods, especially sweet potato tubers and vines) and to provide an important, if temporary alternative source of food that was particularly valuable because of its high protein content. At the same time, household heads made gifts of meat and livestock to kinsmen and friends living at lower altitudes, and also made progressive forays out, with the aim of locating hosts. Then, one to two months after the final frosts, when remaining staple food supplies had been exhausted, massive out-migration occurred. Following the move, migrants were given food and rights to mature gardens. Then cultivation rights were granted, and, in the case of those intending to stay several years, an invitation to build their own houses was extended. Once the family and remaining livestock were established at lower altitudes, the men commenced moving constantly back and forth between the host and affected areas, to harvest pandanus nuts, check on the recovery of gardens, replant, etc. Occasionally

they might be accompanied by other members of the family, but outright return occurred only when sufficient gardens were back in production. In the circumstances, they might remain with their hosts for as little time as six months or for as long as three years. On the other hand, they might never return.

The length of absence normally depended on such considerations as the extent of spontaneous recovery of gardens, the availability of planting materials, and the time taken for crops to mature, or, in other words, the altitude of the gardens, severity of the frosts, and proximity to unaffected regions.

From an adaptive point of view, what is significant about such out-migration is that it is a structured and carefully articulated response to severe frosts founded on an elaborate fabric of social ties linking high- with low-altitude populations. The Fringe Enga differ from the Central Enga not only in terms of population size and density (both of which are low by comparison) but also in certain basic properties of their social system. As Lacey (1973) clearly illustrates, the former tend to be characterised by widely dispersed rather than compacted phratries. In other words, branched agnatic ties linking high- with low-altitude populations are common. Several clans in southern Marient, for instance, have fraternal ties in the Upper Mendi, others in the Kandep and Upper Lagaip with the Lai (Wabag), the Wage with Tari, Porgera, and the Lower Lagaip, and finally some Sirunki clans with the Ambum, Maramuni, and Lower Lagaip. In addition, marriage patterns tend to assume the same directional and altitudinal biases. Thus neither propinquity (distance decay) nor rules designed to spread affinal ties are so pronounced as among the Central Enga.

As may be expected, such ties are constantly being reinforced through exchange of various kinds, and they are in turn obligating for both parties. Thus, as far as the frosts are concerned, they greatly facilitate the occasional massive displacements of population, displacements that are seen to be crucial to the long-term occupation of the high-altitude areas. Indeed, they might almost be construed as designed to respond specifically to this need. However, if Meggitt's assessment of the "quality of life" at high altitudes is retained, it is difficult to understand why the more privileged lower-altitude populations should have any

interest in developing and sustaining such links. On the one hand they are better endowed with resources and are not exposed to any serious environmental risks, while on the other they suffer from high population pressures. In effect, one would expect them to be actively concerned to prevent the development of any relationships that incur obligations.

In reality, the association is far from being one-sided: the frost-vulnerable populations possess or control access to a number of commodities that are highly valued by the Central Enga. The pandanus nut is a luxury vegetable food of major importance. The edible portion is of high nutritional value, particularly with respect to its protein and fat content, and is much relished by highlanders.⁵ Depending on the variety, it may be eaten raw, cooked, or stored for many months if smoked. In consequence, it often enters into gift exchanges. Uncommon below 1800m, it forms extensive stands in the high-altitude depressions and surrounding forests while domesticated forms are planted in groves adjacent to settlements. The pandanus normally fruits during the period December-January-February, at which time entire households will take up residence adjacent to their stands, subsisting almost exclusively on the nut. Relatives are frequently invited to assist in the harvest. From the

5. The estimated food value for *Pandanus julianetti* is 588 calories, 10.7 g. protein, and 59.0 g. fat per 100 g. (quoted in Waddell, 1972: 232).

point of view of severe frosts, the timing of the harvest is extremely significant, for it tends to coincide with the period of maximum food scarcity, and those that have sought refuge at lower altitudes will commonly return for the harvest with their hosts, who are only too keen to supplement their own protein-deficient diets.

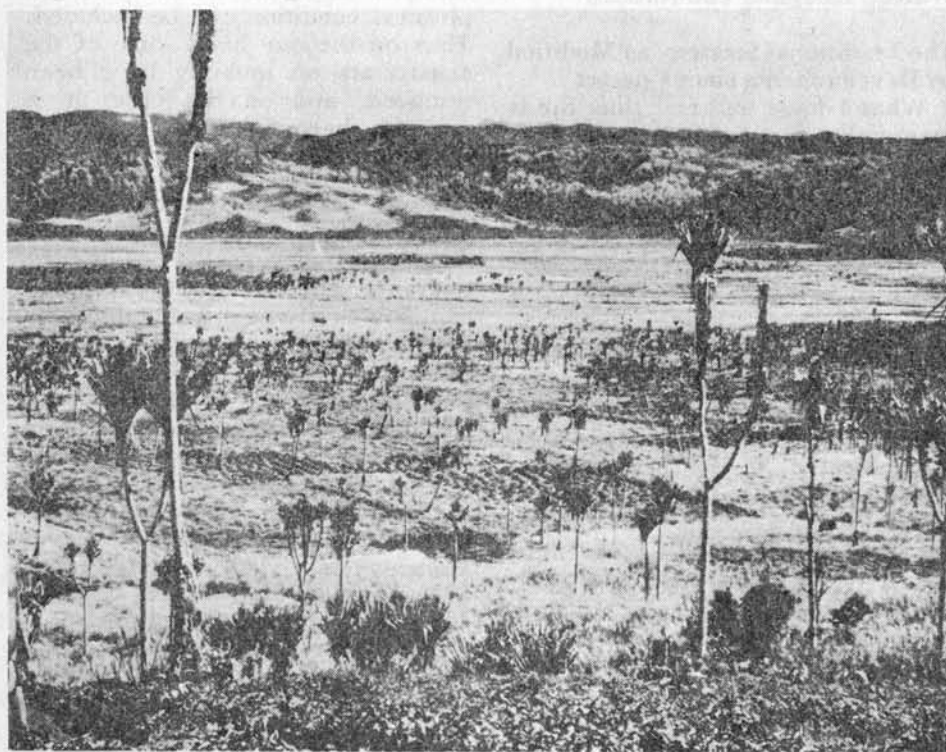
Although the pigs bred in the high altitude fringe areas are relatively few in comparison with the situation among the Central Enga, they are well known for their superior body weight and the quality of their meat. The common explanation provided for this qualitative difference is the excellent foraging provided by the swamplands situated in the centre of the depression. It is in turn believed that, on account of their improved nutrition (they are dependent on domestic foods to only a limited extent), the pigs mature more rapidly. Lower numbers — pig: human ratios probably never exceed 1:1 among the Fringe Enga compared with a peak in excess of 3:1 among the Central Enga — may well reflect a situation where major distributions occur with comparative frequency (every 2-3 years) and there is no complex and more infrequent ceremonial exchange cycle, analogous to the *te*, operating at the regional level.

Irrespective of whether it is grounded in myth or reality this reputation that the high-altitude pigs have results in a constant and

insatiable demand for them among the Central Enga. Because of it, refugees find no difficulty in obtaining hospitality in exchange for livestock.

Apart from having resources of their own which are highly desired by the Central Enga, people of the Kandep area have until recently acted as middlemen in the distribution of certain major traditional trade goods through the Western and Southern Highlands Districts. Four commodities that were, and to some extent still are, handled by the Kandep people are sodium salt, 'tree oil',⁶ a wide variety of sea shells, and stone axes. The first is obtained from springs at Murisosa near Sirunki and serves as the exclusive source for the Southern Highlands. The second originates from the Lake Kutubu area, and the third from the Gulf of Papua, where both are passed on to the Enga by Mendi speakers. Finally, stone axes were obtained from Ialibu. In terms of the proportion of total trade of tree oil and salt, the Enga speakers of the Marient, Kandep, and Wage valleys undoubtedly handled a major share. In the case of the other trade goods, the Central Enga obtained most of their supplies through the Tambul and Minyamp valleys. However, in all cases, demand was never satisfied and hence, even in cases in which their role was a minor one, the high-altitude populations profited from serving as agents in the distribution of essential commodities.

Yet to the Central Enga, the most elementary and perhaps the most vital commodity offered by the high-altitude groups was people, or, in other words, potential allies and recruits to the local group. As I have stressed elsewhere (Waddell, 1973), local groups among the Central Enga are small in size and the lineage system renders membership potentially restrictive. Viewed against the perspective of a quasi-anarchic political environment, high-population pressure on resources, and the obvious fact that natality and mortality rates vary significantly from one group to another over time, it is evident that the survival and good functioning of individual local groups are continually being threatened. Invariably there are some which are short of people, and for them it is axiomatic that equilibrium (in terms of population size and density relative to that of their neighbours) must be restored as quickly as possible. Here, an



Stands of Pandanus. Pandanu Nuts are important as food and for exchange gifts.

6. A vegetable oil obtained from *Camposperma* sp.

event such as severe frost at higher altitudes provides a welcome opportunity. In effect, individual groups among the Central Enga actively solicit immigrants in spite of the fact that overall densities and pressures on resources are high compared with the fringe areas.

Because of the potential or actual continuing value of maintaining close relations with high-altitude populations, migrants are invariably well received when they move down to lower altitudes. The violence and warfare that characterise highland populations and are often stressed for the Enga are in fact confined essentially to relations with immediate neighbours where each group is posing a constant threat to the survival of the other. Such threats do not characterise long-distance relationships, since there is no risk of one group expanding its territory at the expense of another.

Both parties then are interested in developing and maintaining ties, each for different reasons. But while for the Central Enga only a few (the most wealthy) seek systematically to develop long-distance connections and others are content to interact with their immediate neighbours, every Fringe Enga is explicitly concerned to 'open roads'. The reasons for this desire are obvious. Those without ties must pay dearly for their hospitality in the event of having to seek refuge elsewhere. It is not surprising, then, that most household heads in the high-altitude areas can claim among their primary kin at least one individual who is resident in or originates from an area not subject to serious frosts.

Discussion

The obvious conclusion to be derived from this overview of Fringe Enga adaptive strategies is that they possess a diversity of mechanisms designed more or less explicitly to cope with frosts of varying intensities. These several mechanisms may be conceptualised as a three-phased series built into the structure of the adaptation. Of these, the lowest (local) level is in constant operation, whereas the other two become progressively operational as the intensity of the climatic perturbation (frosts) increases. This situation is thus analogous to that described for war processes by Vayda (1974) and lends itself to analysis on the basis of the assumption that "successful human populations, like successful animal species, have evolved mechanisms for achieving

at least rough correspondences between magnitudes of perturbations and magnitudes of responses to them" (Vayda, 1974: 190).

Such mechanisms permit the Fringe Enga to deal more or less effectively with even the severest of frosts that seem to be experienced about once every generation. Thus, of those individuals directly affected by them, about three-quarters can, it is estimated, readily migrate to lower altitudes and at least some of the remainder can 'get by' while remaining behind.⁷

Because of their ability to 'manage' the effects of severe frosts, linked in turn with the fact that historically they controlled access to a variety of highly valued resources, the Fringe populations do not share Meggitt's view of their being comparatively disadvantaged *vis-à-vis* the Central Enga, at least prior to and in the early stages of contact. Their adaptation is simply different: the frost-coping mechanisms demand a degree of mobility that is unknown among the Central Enga. Only 'development' has endowed them with this inferior status because much traditional trading has been eliminated through the provision of more favoured commercial substitutes and because, in the eyes of at least one resident of the Marient valley, the benefits are trickling through to them by a very circuitous route — "If only the Europeans had come directly to us from Moresby instead of via Hagen, Wabag, Laiagam, and Kandepl!"

The Traditional Strategy as Modified by Developments since Contact

What I have outlined thus far is essentially the customary strategy for coping with frosts, i.e., the traditional strategy as modified by certain changes in the subsistence economy but unaffected by direct intervention on the part of government and mission. In fact, this strategy was only partially implemented in 1972 at the extra-regional level in spite of the fact that the gravity of the crisis certainly warranted massive out-migration. As indicated at the beginning of this article, the limited scale of migration was due in large part to the mounting of a relief programme which envisaged fundamentally

7. Scouller (1971) arrived at similar conclusions for a specific population, namely, some groups in the Laigap subdistrict that experienced a localized but fairly intense frost in 1971. He estimated that of the 12,500 affected some two-thirds could readily migrate, while of the 3800 expected to remain behind over half would be able to survive on remaining food resources. In sum, less than 13 per cent of the entire population would require government relief.

different solutions to the problem.⁸ However, both the viability of and necessity for the extraregional strategy have been affected by various other developments in recent years.

As noted, migration has been greatly facilitated by widespread trade and exchange activities which in turn have served to create and sustain kinship ties. However, the progressive substitution of manufactured for traditional goods over the past 20 years or so has led to a very real attrition in these activities. The Fringe Enga no longer play an enviable middleman role in the distribution of stone axes and shells. Sodium salt trade has also experienced a major decline, while only tree-oil has no obvious counterpart in the modern commercial world. In consequence, the Fringe Enga have less of interest to offer to their potential hosts resident at lower altitudes, and there is grave danger of declining interaction for all but a few. Affinal ties may in turn be weakened. All of this is making it more difficult to 'open roads'. On the other hand, the construction of an extensive road network and the operation of an increasing number of 'business cars' (passenger-carrying commercial vehicles) on it certainly renders movement easier. Now, should the circumstances require, public transport can move large numbers of people to lower altitudes, and those who had hitherto been denied the opportunity of migrating because of poor physical condition can be included. Thus on the one hand some of the constraints on mobility have been removed, and on the other it is probably becoming somewhat more difficult to find hosts.

However, the traditional adaptive strategy has been more directly affected by certain plant introductions of varying degrees of frost tolerance. These render the resource complex as a whole less vulnerable and thus make migration less necessary or reduce its duration. Two plant introductions in particular are important, one for the pig population and the other for the human. Kikuyu grass [*Pennisetum clandestinum*], originally introduced into the highlands by the government to cover airstrips and road cuttings and, because of its high protein content, now used by the Department of Agriculture in cattle projects, grows widely through the high-altitude areas. Initially impressed by its suitability for covering ceremonial

8. See Waddell (1974) for a detailed treatment of this point.

grounds, the Enga now value it highly as pig feed. Tolerant of the severest frosts experienced, it provides an excellent alternative food source for the livestock in the event of a crisis, and women systematically harvest it. In this manner, large-scale slaughtering of pigs becomes unnecessary, while any sweet potatoes that survive the frosts can be used exclusively for human consumption instead of having to be shared with the pigs, as was normally the case.

'Irish' potatoes probably entered the high-altitude areas through customary trade routes in the early 1950s. They now assume an important role in the subsistence economy as a supplement to the sweet potato; their principal advantages are a tolerance of mild frosts and a maturation period of 3-4 months, compared with 9 or more for the staple. So well adapted are they to local conditions that they are treated as a semi-cultigen, planted systematically only in new gardens or ones being cleared from a long fallow. Elsewhere, a substantial harvest from self-sown potatoes is obtained after the various greens and before the sweet potatoes reach maturity. The severest of the 1972 frosts killed the growing plants but left the tubers undamaged.⁹ As a result, they continued to be available for consumption, and spontaneous recovery (through resprouting) led to a new crop within three months of the final frosts at the time when, otherwise, the crisis would have been at its worst.

In addition to the Irish potato, there are several greens of admittedly limited importance that have diffused widely through the region in the past 20 years or so, again largely as a result of Enga initiative. These are the common cabbage (*Brassica oleracea*), Chinese cabbage (*Brassica chinensis*), and a semi-cultigen, watercress (*Nasturtium officinale*). Finally, there are several 'European vegetables' which are grown for sale but are as yet of limited appeal for domestic consumption, namely parsnips, peas, and beans. All these greens were unaffected by the 1972 frosts.

These various developments since contact have served collectively to diversify and strengthen the Fringe Enga subsistence food complex, which prior to contact consisted essentially of a sweet potato staple, some taro, sugarcane [*Saccharum*

officinatum], *Setaria palmifolia*, and a few minor greens. The damage done to it by severe frosts is no longer quasi-total, and much more important, the period without a major food source available is much reduced. This serves to mitigate what Scoullar (1972: 7) refers to as "the most critical period of food supply" which may be expected to occur "between 5 and 8 months after the frost". Previously, there was migration by all who were able to migrate, while those obliged to remain behind subsisted for many months on a starvation diet of a few greens (both wild and cultivated) that recover within a month or so of the frosts,¹⁰ plus the product of hunting and foraging in the forest. With an increase in the numbers being able to remain behind and subsist on a more adequate diet and with a reduction of several months in the necessary period during which the majority must resort to out-migration, a relative, although as yet limited, decline in the importance of the extraregional level of coping with the frost hazard is occurring.

Since the Fringe Enga themselves are entirely responsible for these modifications to their subsistence resource base, it can be assumed that this trend toward increasing sedentarisation of the adaptive strategy will continue, irrespective of the form that any government intervention may take in the event of a crisis. To date, however, these observed changes, while indicative of future trends, are of no great material significance. With the sweet potato still the staple, and most of the major subsidiary crops not frost-resistant, mobility at the intra- and extraregional levels continues to serve as a vital mechanism for coping with all but the mildest of frosts.

The Incompatibility of Customary Coping Mechanisms with Modernisation

While the Fringe Enga themselves are changing their subsistence economy in ways that are reducing the necessity for the most extreme forms of mobility, externally induced developments are also contributing to a greater sedentarisation of the population.

Since contact, a new institutional structure has been created and initial steps have been taken to integrate the local population into a cash economy. Post-contact political units

comprise much larger populations than the traditional clan. These units are at once responsible to and served by a government — initially, an Australian administration and, since 1974, an independent government — concerned primarily with law and order, and health and welfare. In recent years, a degree of regional autonomy has been achieved in the form of local government councils and representatives at the national House of Assembly. Christian missions, concerned principally with evangelisation, have created similar but separate institutional structures centring on 'mission' rather than 'government' stations. Attempts have been made by both institutions to stimulate commercial crop production at the local level, in the form of cattle raising, pyrethrum production, and the sale of a variety of vegetables. Outlets for the money so acquired are provided largely through a developing network of local trade stores as well as a system of annual tax collection by the local government council.

Clearly, if these various enterprises are to function efficiently, the population must be constantly shifting. Its stabilisation is necessary for development. In view of this fact, it is not surprising that government and missions actively sought to discourage out-migration in 1972. Irrespective of World Health Organisation guidelines, they, as institutions, had a personal stake in retaining the affected populations in the disaster areas.

While this trend toward sedentarisation may be irreversible, it is nevertheless important that the pressures exerted by external agencies do not exceed the capacity of the population itself to sustain the process. From an adaptive point of view, acting quickly to discourage mobility is not only unnecessary but also very expensive, as illustrated by the 1972 experience, wherein the government had to assume full responsibility for the support of those victims of frost that they had persuaded to remain behind. Strictly speaking, to administrate and to proselytise are largely self-justifying acts. They bring limited tangible benefits to the population, and frost victims are in no sense denied these benefits in the event of their migrating elsewhere, since all Enga are served by the government and one or other of the Christian missions. It is rather the commercial economy which, in a measurable sense, suffers from migration, through an immediate curtailing of production

9. This contrasts with sweet potato tubers, where rot quickly sets in, rendering them inedible within 1-2 months of the killing frosts, and earlier if rain comes.

10. The most important of these greens were *Solanum nigrum*, *Oenanthe javanica*, *Brassica*, *camp*-*estris*, and *Commelina diffusa*. People also scavenged through the abandoned food gardens.

and entrepreneurial activities and through longer-term effects on the investments already made. As far as the Fringe Enga are concerned, however, this sector remains very poorly developed. Thus in the Laigap sub-district, pyrethrum is the principal local source of revenue, yet sales over the year 1971-1972 amounted to only about \$120,000, with an additional \$25,000 or so being earned from vegetable and beef cattle production. Even by highlands standards, such a level of commercial activity is slight for a population of 65,000.

It may reasonably be assumed from this that the form of intervention adopted in 1972 was inappropriate.¹¹ More seriously, in systematic terms, its long-term effects are likely to have been disruptive rather than constructive on account of the active discouragement of the third phase of the response to the other hazard, that of extraregional migration. Further, the gestures, along with other general transformations associated with the contact experience, are leading to the progressive attrition of the infrastructure that permits this extreme response.

It is evident that, in the event of

future environmental crises, relief should be designed to supplement and strengthen customary mechanisms for coping with the frost hazard, rather than to undermine them. This requires familiarity with these mechanisms to a degree rarely found among government and scientific personnel. It requires also some commitment to improving the effectiveness of the mechanisms in the context of an evolving political and economic environment. The challenge is considerable, because we are only now developing the conceptual tools for gaining understanding of the relationships between the temporal dimensions of stresses and responses; and a colonial and Third World situation is not propitious to acting on the basis of such understanding. Thus the very disruptions inherent in a colonial situation mean that intervention is invariably geared more directly to the interests of the institutional structures and commercial enterprises than to the interests of the population at large.

Acknowledgement

Some of the central ideas elaborated in this article have arisen out of discussions with Paul Wohlt and first-hand observation of his field-work situation in the Upper Wage valley. I am much indebted to him.

Bibliography

- Brookfield H.C. (1962). *Local study and comparative method: An example from Central New Guinea*. Annals of the Association of American Geographers 52: 242-254.
- Edwald, E. (1972). *Presentation to frost relief committee*. New Guinea Lutheran Mission, Wabag, 16 pp., mimeographed.
- Lacey, R. (1973). *A question of origins: An exploration of some Enga oral traditions*. Department of History Seminar, University of Papua New Guinea, 22 pp., mimeographed.
- Lacey, R. (n.d.). *Toktok bilong pipel Kandep*. 9 pp., typescript.
- Malcolm, L.A. (1972). *The famine situation in the Western and Southern Highlands of Papua and New Guinea - Estimated food needs and health surveillance*. District Health Office, Lae, 10 pp., mimeographed.
- Meggitt, M.J. (1972). *System and subsystem: The exchange cycle among the Mae Enga*. Human Ecology 1: 111-123.
- Scoullar, B. (1971). *Frost damage - Subsistence gardens, Laigap subdistrict. Summary report and recommendations*. Department of Agriculture, Stock and Fisheries, Papua New Guinea, Laigam, 7 pp., typescript.
- Scoullar, B. (1972). *The effect of frost on sweet potato production at higher altitudes in the highlands of Papua New Guinea*. Department of Agriculture, Stock and Fisheries, Papua New Guinea, Laigam, 8 pp., mimeographed.
- Vayda, A.P. (1974). *Warfare in ecological perspective*. Annual Review of Ecology and Systematics 5: 183-193.
- Waddell, E. (1972). *The Mound Builders: Agricultural Practices, Environment and Society in the Central Highlands of New Guinea*. University of Washington Press, Seattle.
- Waddell, E. (1973). *Raiapu Enga adaptive strategies: Structure and general implications*. In Brookfield, H.C. (ed), *The Pacific in Transition: Geographical Perspectives on Adaptation and Change*, Edward Arnold, London, pp. 25-54.
- Waddell, E. (1974). *Frost over Niugini: A retrospect on bungled relief*. New Guinea 8(4): 39-49.

11. I have argued this point at some length in Waddell (1974).

REMEMBER TO SUBSCRIBE

NAME:

ADDRESS:

Month of first issue required:

Cheques, money orders, postal orders should be crossed and made payable to The Ecologist, and sent to Subscription Department, The Ecologist, 73 Molesworth Street, Wadebridge, Cornwall.

Make sure of your copy of THE ECOLOGIST by taking out an annual subscription. Ordinary rate £5.50 (U.S.A. \$14.50). Members of the Conservation Society, Friends of the Earth, The Soil Association, Henry Doubleday Research Association £5.00. Students attending a full time course £4.50.

AFTER THE SHOALS THE TIN CANS



Last Saturday was, I believe, World Environment Day. Whoever determined the date of the Conference (I have to restrain myself from using the word 'symposium' which sounds big and awesome) must have borne this in mind.

Perhaps because I am a new Prime Minister I was ignorant of Environment Day until I read about it in the *Auckland Herald* and in the *Fiji Times*. On being asked a second time to open the Conference (I politely turned down the first invitation) I forced myself to reflect on the issues affecting man and the environment.

The basic issue seems to me to be a search for a happy relationship between man and the environment. Until quite recently Pacific man lived in almost idyllic harmony with his environment. Indeed, it could be said that his culture, if not his existence, was founded on a carefully cultivated relationship with nature.

The first quarter of the moon "Atu-a-pupula" is one of the signals for bonito fishing. The moonless night "pop-loloa-lemasina" is the call for lobster fishing. When the flower on the *aloalo* or *gatee* blooms, it is the season of the lo — "tai-lo". The red-lipped mullet of Pu'apu'a (Papua) appears in between the first and second rise of the *palola* — "va-i-palola". Our double canoes, guided by the stars, often travel to points a thousand or more miles apart. There exists a somewhat mystical intercommunion between man, the moon, the stars and the plants.

On the night before the *palola* rises the villagers dance and sing. A little before sunrise, garlanded, they set out in flower-bedecked canoes. It is a very sensual picture of men and women setting out to rendezvous. Is it accidental that latterly it has been found that the rise of the *palola* has something to

do with the mating of the coral worm?

The high point in this communion with nature is, to my mind, reached when the *tautai* escort shoals of fish to the shore. It is a religious ritual which begins with the fasting and praying of the *tautai*. At appointed hours he leaves his hut, strides to a jutting rock, and with hands cupped over his eyes he looks out towards the sun. If his God does not nod he returns to his hut. He perseveres until one day he announces "he has come" as if a beloved kin had surfaced on the horizon. He heads for his canoe, pushes it out to sea, seats himself and paddles. A flotilla of canoes follow. The shoal is discernible only to the *tautai* at this point. A few yards from the shoal the *tautai* stops, raises his paddle, twirls it and chants. He welcomes the fish in chiefly language. He resumes his seat and heads for shore. The shoal follows compulsively. "O le i'a a le tautai e alu i le fa'alolo" is a proverb meaning: the shoal follows the *tautai*'s will. In some cases the fish enter traps, in other cases they throw themselves suicidally on the beach.

Today it is a different story. Fish inside the reef which were once the mainstay of our protein diet are becoming increasingly scarce. *Ava niu kini* and dynamite are largely responsible. I've experienced the trauma of witnessing the deathly white and softened coral and sea plants a day after the laying of the *ava niu kini*. There is an eeriness which bespeaks mutilation, profanity and even death.

As fish become scarce the *ava niu kini* and dynamite are even more necessary to ensure a respectable catch. I'd like to cite two cases to highlight the plight of fish and fishing.

During the mullet season the catch from the Leulumoega *upega* could feed the Aana district. When the

upega was revived six years ago the catch from the first six months was not enough to feed the village, let alone the district. Nor was it enough to justify the expense of maintenance. The Leulumoega fishermen gave up in despair.

In 1976, Western Samoa will import slightly over one million dollars worth of canned fish. This represents approximately 5 million 11b. cans of fish, or approximately 32 11b. cans for every man, woman and child living in Western Samoa. We must also take into account, when we consider the importation of canned fish, the untold environmental pollution caused by 5 million empty cans.

The traditional containers i.e. baskets woven from palm leaves, banana and breadfruit leaves are easily disposable. Empty cans are not. But whereas this type of pollution is readily visible to us, it is not the worst pollution problem. What is not easily disposable is not as bad as what is not dissolvable.

The chemicals from weed killers, pesticides and DDT, do not dissolve but remain in the soil and water and frequently find their way into the fatty tissue of animals. A substantial portion of the waste from the smokestacks of British factories does not dissolve but travels several miles and finds its way into Swedish lakes, polluting drinking water and affecting soil fertility. It has been said that less water vapour is given off from the oceans than before because of the increasing concentration of chemicals in the water. Aside from the destruction of the natural processes on which marine life depends, our water supplies might ultimately be affected.

Pollution is no respecter of national boundaries, and it has become as much your problem as it is mine. And it might serve to underline the point that we inhabit one earth; for in order to cope effectively, the solution cannot be a national solution; it must be an international solution.

Your task, as I see it, is to seek to resolve the disharmony either by finding a new harmony or by reducing the disharmonies to levels that would ensure a stable existence for human and animal life. It is no small task and I wish you well in your endeavour.

Prime Minister Hon. Tupola Efi's speech on the opening of the Plenipotentiary Meeting to discuss a draft convention on the conservation of nature in the South Pacific in Apia, Western Samoa, June 9th—June 17th, 1976.

A Babylonish Collection of Names or Sounds

William Cobbett reflects on the National Debt

by Molly Townsend

In the last few months, the problems of unemployment and inflation have begun to be overshadowed by a new one — the interest we have to pay on the National Debt. All the tightening of belts, all the cuts in government spending, are apparently of little avail. And why? Because they are insufficient to cope with this newly resurrected monster, the National Debt.

In an article in *The Times* in February, Mr. Peter Jay, analysing the Government's estimates of future expenditure, says: "The reason for the increase in planned spending is simple and real, namely interest on the National Debt . . . the provision for debt interest in 1978-79 has been increased by £3,300 million". Mr. Jay then adds this grim warning: "The political consequences of a world in which people pay taxes principally in order to meet the cost of interest on the national debt . . . defy imagination."

One hundred and sixty-six years ago, a prisoner in Newgate, incarcerated for two years for protesting against the flogging of British soldiers, was worried about this very same phenomenon. He, too, was living in a time when the national debt was rising at an unprecedented rate, when money bought less and less, and when taxes were rising higher and higher. While serving his sentence, he wrote a series of letters addressed to the thinking people of the country, which were subsequently published as a whole under the title "Paper Against Gold". The prisoner was William Cobbett.

The object of those letters was "to render a subject, which has always been considered as intricate and abstruse, so simple as to be under-

stood by every reader of common capacity". As Cobbett foresaw very clearly that the national debt was bound to increase, it may be worth looking into the grounds of his arguments.

Early in his book, Cobbett prints a table showing the increase in the national debt. To prove his statement that all will be so simple that anyone of common capacity will be able to understand it, and because the figures are a little more manageable than those of the present day, I give it in full. The subject is the increase in government borrowing; the date, 1810.

When QUEEN ANNE, who succeeded William came to the throne, which was in the year 1701, the debt was . . . £16,394,702
When GEORGE I came to the throne in 1714, it was . . . £54,145,363
When GEORGE II came to the throne in 1727, it was £52,092,235
When GEORGE III came to the throne in 1760, it was £146,682,844
After the AMERICAN WAR, in 1784, it was . . . £257,213,043
At the latter end of the last war; that is to say, the first war against the French Revolutionists, and which, for the sake of having a distinctive appellation, we will call the ANTI-JACOBIN WAR; at the end of that war, in 1801,

the Debt was . . . £579,931,447
At the present time; or rather, in January last: . . . £811,898,082

Cobbett then points out that this debt is called by many names: 3 per cent Consuls; Omnium; The Emperor of Germany's Debt; Exchequer Bills; Long Annuities; The Prince of Portugal's Debt; and so on, but he tells his readers to disregard this "worse than Babylonish collection of names or sounds":

So that we are taxed to pay the interest of it, what matters it to us by what names the several parts of it may go by? I hope there is not, at this day, a man amongst you who is to be amused by empty sounds. I hope that your minds are not, nowadays, to be led away from the subject before them by any repetition of mere names.

So Mr. Jay and Mr. Cobbett are at one, except that the former is talking about an *increase* of £3,300 million in interest alone, and the latter a *total debt* of £811 million. Cobbett goes on to mention that in the actual figures laid before Parliament there are some shillings and pence and even farthings, but "though the accountants have been so nice, we will not mind a few

farthings". Mr. Jay too, in language a little more esoteric, adds finer touches his figures, but by and large there can be no doubt that the only thing that has changed is the quantity of money involved.

In explaining how the debt arose, Cobbett traces the rise of the Bank of England from its founding in 1694. At that time, William III, needing funds for his war against France, borrowed it from individuals and raised taxes on the nation for the purpose of paying the interest. The lenders were formed into a Company — The Governor and Company of the Bank of England — and this Company continues to this day.

The lenders of the money, who in time, came to be called fundholders, or stockholders, did, as the work of lending and fund-making advanced, make their loans in various ways, and the bargains between them and the government were of great variety in their terms; but it was always the same thing in effect: the government borrowed the money of individuals and it mortgaged taxes for the payment of the interest.

Cobbett tells his readers that by the time he was writing, this lending of money to the government had become so commonplace that people had begun to forget what it was they were really doing. They say that they "have money in the Funds" and imagine that it is in a *place* where money is kept:

A place, indeed, of a sort of mysterious existence; a sort of financial *Ark*; a place not perhaps to be touched, or even seen; but still the notion is that of a place, and a place, too, of more than mortal security.

Alas! the Funds are no place at all! and indeed, how should they, seeing that they are in fact, one and the same thing with the National Debt.

To make matters even clearer, Cobbett in this part of his book, "the elementary, the mere horn-book part of our subject", asks us to imagine the government wanting to borrow a million pounds, and receiving a loan of this amount from a Messrs. Muckworm and Co. What does Mr. Muckworm receive in return?

Why, his name is written in a book; against his name is written that he is entitled to receive

interest for a million of money; which book is kept at the Bank Company's house, or shop, in Threadneedle Street, London. "Well", you will say, "but what becomes of the money?" Why, the Government expends it, to be sure; what should become of it? Very few people borrow money for the purpose of locking it up in their drawers or chests. "What? then the money all vanishes, and nothing remains in lieu of it but the lender's name written in a book?" Even so; and this, my good neighbours, is the way that money is put into the Funds.

But, we are told, Mr. Muckworm is as wise as he is rich. He parcels out his share of the Funds and sells them to a variety of people (not forgetting to charge them a commission) who then become entitled to receive the interest. But why should people buy them? The answer is simple. Farmer Greenhorn having worked hard all his life, decides he will leave to his daughter, not his farm with all its attendant risks, but a sum of money safely 'in the Funds'. He buys £2,000 of Mr. Muckworm's shares, and his daughter, Grizzle Greenhorn, becomes the owner of stock. But the plain fact is, Cobbett continues:

that Muckworm's money has been spent by the government, that Muckworm has now the two thousand pounds of poor Grizzle Greenhorn, and that she, in return for it, has her name written in a Book, at the Bank Company's house in Threadneedle Street, London, in consequence of which she is entitled to receive the interest of the two thousand pounds; which brings us back to the point whence we started, and explains the whole art and mystery of making loans and funds and stocks and national debts.

Funds and Stocks, so far from meaning a place where a great quantity of money is kept, are not the name of any place at all, nor of anything that has a corporeal existence, and are the mere denominations, or names, of the several classes or parcels of Debt, which the government owes to individuals.

With the knowledge that there was profit to be made in accepting deposits and making loans, others entered the banking trade, and in Cobbett's day, as in ours, there was a Bank of England and there were country banks. The great difference

was that until 1797 a Bank Note could be changed into gold on demand, and the coinage was made of gold and silver. But in that year, 1797, Pitt's government passed the first of a series of Bank Restriction Acts, preventing the bank from discounting its notes into gold. The reason given out officially was that, although there was plenty of gold in the Bank, the alarms over the possible invasion of England by the French Revolutionists had caused such a run on the banks for gold (the people thinking it safer in an emergency to have the King's picture in gold than a piece of paper) that it was thought expedient to suspend cash payments for 52 days. After that time, Pitt assured the nation, notes could be freely converted again.

And now we come to the nub of the matter. What had in fact been happening, slowly from 1684, but accelerating since the American War of Independence, was that the government had so increased its borrowing that the interest, paid always in notes by the Bank, could by no stretch of the imagination have adequate gold backing. (For, as Cobbett reminds us, if we recall the story of Mr. Muckworm, how else could the Bank pay interest other than in promissory notes, when the original money had been handed over to and spent by the government.) An increase in the national debt means an increase in interest; an increase in interest means an increase in paper money; and an increase in paper money inevitably leads to a depreciation in its value. There is, says Cobbett, no mystery in this.

Money, of whatever sort, is, like everything else, lowered in value in proportion as it becomes abundant or plenty. As I said on a former occasion, when apples are plenty, apples are cheap; and cheap means low in price. The use of money is to serve men as a sign of the amount of the value of things that pass from man to man in the way of purchase or sale. It is plenty or scarce, in proportion as its quantity is great or small compared with the quantity of things purchased or sold in the community; and whenever it becomes, from any cause, plenty, it depreciates, or sinks in value.

And, in case this is not completely clear, he explains later:

We talk about dearness; we talk of high prices; we talk of things

rising in value; but the fact is that the change has been in the *money* and not in the articles bought and sold; the articles remain the same in value, but the money, from its abundance, has fallen in value.

This increase in paper money and the fall in its value, which today we call inflation, had already caused some alarm before the run on gold in 1797. Pitt, seeing the danger, had endeavoured to reduce the debt by creating the *Grand Sinking Fund* in 1782. Its intention was clear. It made provision to put aside each quarter a portion of the taxes, and these sums, with their accumulated interest, would be used to purchase the original loans, or, in other words, to pay back the lenders. But what really happened? Cobbett explains that when the government bought back loans from the Grizzle Greenhorns "you would naturally think that we were no longer taxed to pay the interest on this part of the debt". But extraordinary as it may seem, this was not so. When our old friend Grizzle Greenhorn is given back her £2,000, her name is indeed crossed out of the Book, but in its place is written the name of the Commissioners of the Sinking Fund, and the people continue to pay taxes to pay interest to the Commissioners!

Cobbett is kind enough not to impute evil designs to this curious way of going about things. He believes the intention was to accumulate yet more money to redeem yet more debt. The effect, though, was different. Seeing the debt being paid off, the people's confidence in the nation's finances was enhanced, and they were willing to lend even more. What government is not prepared to borrow when people are eager to lend? The net result of the whole operation of Pitt's Sinking Fund was to increase the national debt.

There was, to be sure, when people looked into the matter more closely, something rather whimsical in the idea of a nation's paying interest to itself; something very whimsical in a nation's getting money by paying itself interest upon its own stock. Many persons thought so at the time, and some said so, but the country, infatuated with its "Heaven-born Minister" became deaf to the dictates of common sense; and with as much fondness as the mother hangs over her smiling babe, it cherished and fostered the fatal delusion.

So, knowing the results of the Sinking Fund experiment, when Pitt passed his first Bank Restriction Act Cobbett was not fooled. He was quite aware of the fact that the Bank did not need to hold a quantity of gold equal to the amount of its promissory notes. Some of the money deposited could be lent out at interest, but he was less complacent about this than we are today. The fact that some of those who so lent out money could, from the profits they made, hold entertainments so lavish that, "probably as much was consumed in one evening as would have maintained the whole village of Morden for a year"; that at the death of one of these Pillars of the City, the Ministers "sent off a Messenger, with the melancholy tidings to *the King and the Prince of Wales*"; all this was a little too much for Cobbett to stomach without protest. But when he read in the 'venal prints' (Cobbett's name for those newspapers which supported the government, and those whose writers he was certain were in the pay of the government) of Pitt's excuses for preventing the Bank from redeeming its notes in gold; when he heard the government and the newspapers assuring the people that there was plenty of gold, and that the Bank actually wanted to pay in cash; then his indignation at the hypocrisy of it all knew no bounds.

His suspicions of the Act were confirmed by the extraordinary antics of the Bank at the time. When the Bank Restriction Act was passed, the Bank held a public meeting. The Directors told their shareholders that, although there was plenty of gold in their deposits and they earnestly hoped the government would soon allow them to resume payments, they had acquiesced in the Act forbidding them to do so. The shareholders then passed a Resolution thanking the Directors for complying with the Act.

What! thank the Directors for not paying their promissory notes! Thank, aye, and publicly thank, their agents for having refused payment of those notes! Gentlemen, our venal prints may talk as they please; they may refer us to what instances they choose; but anything equal to this, any such instance of cool assurance, I defy them to produce from the history of the world, or even from the works of imagination.

It seemed perfectly plain to Cobbett that, in spite of all the

protestations to the contrary, not only was there not enough gold to redeem the notes, but the Bank and the shareholders were in active collusion with the government to prevent the public from finding it out. In short, the Bank had persuaded the government to pass the Act, and it was the Bank itself which wanted to stop payments.

How right he was can be seen from the Acts that followed. The first Act, in May 1797, forbade redemption for a mere 52 days. This was followed by more Acts:

In June, 1797, — until one month after the next session of Parliament. In November 1797 — until one month *after the conclusion of the War* (Bravo, says Cobbett, give them an inch and they will take an ell).

In April, 1802 — *after peace was declared* for one year.

In February, 1803 — for another nine months.

In December 1803 — until six months after the ending of the new war. (When the war ended with Waterloo, the restrictions continued.)

Throughout all this time, although pressed by the Opposition, the Government never published the actual figures of the amount of gold in the Bank. They did set up a Secret Committee before the third Act of 1797 to report on the state of the Bank's resources, and this Committee made a report to the House which Cobbett printed in full.

I will venture to say that a more curious document never was produced in the world. Every syllable of it is worthy of your attention; and I beg you to go carefully through it before you proceed any further.

This report, while specifically stating that the Bank might with safety resume its accustomed functions, and that the Bank's resources had increased to five times the value of what they had been nine months previously, yet thought it expedient to continue restrictions — and this for the duration of the war. (But when the resources were allegedly five-times smaller, 52 days were considered enough.) When pressed in Parliament as to reasons for the continued restrictions, the Minister replied that "we were contending with an enemy whose object it was to attack the credit of the country and to embarrass its financial operations". A perceptive Member thought it a most "whimsical expedient" to destroy our credit so that the enemy should

have no credit to attack and enquired if this was really the way to prevent the enemy from succeeding. He got no reply from the government benches.

So the national debt went on rising. The Sinking Fund, the French wars, and the Bank Restriction Acts so reacted one upon the other that by the time Cobbett was writing his book, the debt stood at £811 million and the taxes had risen from £15 million in 1792 to £70 million in 1809. To underline the connection between the increase in the national debt and the increase in paper money (leading to its depreciation in value and a rise in prices) Cobbett reminds his readers that when the debt was much smaller most transactions were made in gold coin. The Bank began by issuing no notes under £20, but, as the debt grew, so, in step with the rise, £15 notes, £10 notes, £5 notes and, at the time he was writing, £1 notes were circulating freely and gold guineas had almost disappeared.

Cobbett was born in 1763. He could remember the time when the total taxes levied to pay interest on the national debt were nine million pounds. By the time he had finished his *Paper Against Gold* they had risen to nearly forty-four million. Taxes were such that "the direct taxes alone upon a farm exceed in amount all that it takes to pay and feed all those who labour on that farm." The pauper population had nearly trebled in his own lifetime. He was living through the beginnings of the Industrial Revolution and, as he was to show later in his most famous book *Rural Rides*, the mysteries were mounting.

Cobbett believed in the dignity of the common man; he believed passionately that men had a right to work and live on the fruits of their labour. He preached, in the age of the depopulation of the countryside, the virtues of country life. And now, to his thinking, the results of the Paper Money System were ruining the England he loved. So for Cobbett there was only one solution:

The total destruction of the National Debt; the total breaking-up of the Funds and the Bank Note system.

He knew that the critics of such a radical proposal would foretell ruin and destruction, but answers them in advance.

Gentlemen, are such apprehensions to be entertained by rational men? No: the corn and the grass and the trees will grow

without paper money; the Banks may all break in a day, and the sun will rise the next day, and the lambs will gambol and the birds will sing and the carters and the country girls will grin at each other, and all will go on just as if nothing had happened.

The people of England were brave and free, happy at home and dreaded abroad, long before paper money was heard of. All those laws, which we yet boast of as the great bulwark of our freedom, existed before paper money was thought of. Before the Paper System existed, there were not more than two hundred thousand paupers in England and Wales: there are now twelve hundred thousand.

Though the Muckworms would suffer, though "their knees should knock together and their teeth chatter in their heads", Cobbett was not without a thought for all the Grizzle Greenhorns. He cites Austria, England's ally in the French wars, as an example. They had just decided to return to gold and they were not unmindful of the ruin this could cause to the Austrian Fundholders.

The Emperor, like an honest man, has, as the newspapers tell us, sent all his plate, gold and silver, in whatever shape, to the mint to be smelted down and turned into coin for the payment of people who have lent him and his Government their money. And besides this the Clergy, animated by a zeal for their sovereign truly worthy of example, have given up their estates to be sold for the same honest purpose. Accordingly, we see accounts in the public prints of the Sales of Church Lands going on in Austria. They are said to sell remarkably well; and, it is stated, that these sales, together with the meltings of the Royal Plate, will yield enough to satisfy all the Government Creditors; or, at least, to afford them the means of living beyond the reach of misery.

If I were to propose that the same should be done here as is now doing in Austria, what would there be, in my proposition, injurious to either the station or character of the king or the clergy? Am I to suppose that the Crown depends upon the possession of a parcel of plate by the King and the Royal Family: that a throne, the seat of kingly power, is supported by a

waggon load, perhaps, of gold and silver dishes and plates, and spoons and knives and forks and salvers and candlesticks and sauce boats and teapots and cream jugs? And, as to the Church, what could her sons wish for more earnestly than an opportunity of giving us a proof of their disregard of things temporal?

I doubt if all the Queen's treasures and all the ecclesiastical lands would amount to more than a farthings-worth of our present national debt. But there are faint murmurs in the newspapers today of a return to something like a gold standard. Cobbett's views on farming and ecology are already becoming popular. I wonder if it is now time for us to turn back to his horn book on the history of government borrowing of which he said: "My work on Paper Money I believe to be the best of my life"?

If Mr. Jay is right, we will be hearing a lot more about the National Debt. When we do we might, perhaps, remember Cobbett and try not to be "deaf to the dictates of common sense". The Babylonish collection of names and sounds may be a little different today, but I hope that Cobbett's faith in the common man remains true, and that if "whimsical expedients" for remedying our present troubles are put forward in our own venal prints, there will not be:

at this day, a man amongst you, who is to be amused with empty sounds.



AUTHOR OF "THE POLITICAL REGISTER"

Mary Evans Picture Library

The Ecology Movement Re-Examined



by Henryk Skolimowski

When one looks at the field of what is broadly called the ecology movement, one sees an extraordinary proliferation of ideas, efforts, activities and publications. There are many tributaries, but they do not connect up to make a river; lots of mini-influences, but they do not add up to make a significant difference to the existing socio-economic paradigm; lots of new educational departures and glimmers of a new awareness, but no new consciousness which would significantly re-direct our perception of the world and our interactions with it; and also there are no new values, without which the ecology movement cannot really succeed. One of the main reasons for this unsatisfactory state of affairs is an excessive preoccupation with gadgets among many ecology minded people.

Of late, this tendency to build windmills, sun collectors and silos has become a passion in itself, which is overshadowing the actual ends of the ecology movement. We hear a great deal nowadays about windmills. But we must ask: what is it for? What is the reason behind those windmills and silos? Often, alas, it is a mere fascination with new gadgets.

Let me give you an example. The Architectural Association School

of Architecture in London is very ecology conscious. It is one of the most ambitious and forward-looking schools of architecture in the world, and it always gives me pleasure to teach there. Being around gives one an opportunity to see what is going on. Windmills are 'in'. A lecture with slides would commence in which the construction of a windmill is explained.

"Now, man, this is how we did it. That is how we have proceeded."

"How does the windmill work now?" someone from the audience would ask at the end of the lecture. "It does not. It collapsed with the first big wind . . . But we have learnt an awful lot from our experience."

One does not wish to make fun of genuine efforts, but one has to keep the entire matter in a proper perspective. And the entire matter is not about better ways of making hay, is not about more efficient organic gardening, is not about windmills and solar collectors; it is about a better way of life. The windmill in this context is a token of the alternative totality towards which we are groping, but which cannot be reduced to ecological gadgets. Let me repeat, increased efficiency of haymaking, organic gardening or

windmills is *meaningless in itself*. It is meaningful and admirable, on the other hand, if it is a means to an end, which is an alternative lifestyle: individually sustaining, socially co-operative, biologically enhancing and remaining in symbiosis with the rest of nature. All these notions are subtle and complex, and we are far from fully comprehending them.

If our objective is to create a new lifestyle in which human, social and ecological concerns are harmoniously woven together, then this objective cannot be accomplished by an obsessive pre-occupation with silos, windmills and horticulture, as if these were ultimate things. If we do become so obsessed, then we are not far from mindless technicians, the techno-maniacs, who are machine-happy and for whom the machine is all. Bertrand Russell once said that whatever values are, they are not machines. This dictum has been reversed of late, as some proclaim that whatever is valueless, a machine is not. My discussion so far may seem to be an open challenge to the ecology people to reconcile their beliefs and their practices. And indeed it is meant to be a challenge.

The second important cause of the present crisis of confidence in the ecology movement lies in its once excessive revolutionary zeal, or at any rate in its once excessive revolutionary rhetorics. The age of instant coffee, of instant communication, of instant sexual gratification was bound to produce a desire for instant revolutions. Many self-styled revolutionaries have identified themselves with the ecology movement and attempted to use it for their own crusades of instant re-making of the world. But even in the Scriptures God does not create the world instantly. It is little wonder, therefore, that ordinary humans cannot instantly remake it. As a result of the frustration of their desire to remake the world instantly, some of the self-styled revolutionaries are turning their revolutionary zeal in another direction. Eldridge Cleaver is a case in point. He is now, and I quote, "seeking legitimate business associates to finance and organize marketing of his revolutionary design in male pants". He told the *International Herald Tribune* (August 14, 1975): "I want to solve the problem of the fig leaf mentality . . . Clothing is an extension of the fig leaf, it put our sex inside our bodies. My pants put sex back where it should be."

The Good Food Growing Guide

JOHN BOND and the staff of 'Mother Earth'

48 illustrations

£3.95

John Bond and the staff of 'Mother Earth' believe that food grown organically, according to nature's own rules and rhythms with no artificial fertilisers or pest-destroying sprays is best both nutritionally and ecologically. Now, in conjunction with Thompson & Morgan, they have produced a complete guide to growing food naturally. As more and more people become worried about today's environmental problems they are looking for ways of living free from chemical interference. Here is all the basic gardening information they will need from soil preparation, planting guides and crop rotation to yield, fully described in this new-look growing guide to healthier and happier living.



David & Charles
NEWTON ABBOT · DEVON

And so it is: from *Soul on Ice* to the revolutionary fig leaf pants. Cleaver's revolution in men's pants, he insists, is "destined to revolutionize men's fashion and corner (the) world market". (Note the phrase: "and corner (the) world market".) This kind of prostitution of one's talent is not just a personal tragedy of one writer. The world 'out there' is just waiting for this kind of conversion and is ready to remunerate handsomely new converts to the old creed of greed and material acquisitiveness. This kind of conversion is easy to make. On the other hand, it is difficult to maintain an unflinching integrity in one's efforts to improve the world and make it a *humanly* better place to live in. It is for this reason that so many pseudo-revolutionaries have faded away. I am not saying that all radically minded people concerned with ecology are going to follow Cleaver's path. But I am perhaps saying that Cleaver's 'conversion' is more symptomatic of our times than many would like to believe. Ecology minded people should be fully aware that revolutionary rhetorics are easy, while to re-think creatively existing options is difficult.

This brings me to the next point which perhaps bridges and incor-

porates the other two, that is, the fascination with ecological gadgets and waning revolutionary zeal among ecology minded people. It seems to me that the major weakness of the ecology movement is the lack of a comprehensive philosophy as its basis. I must add however that I am perfectly well aware of the plethora of partial alternatives. But since these alternatives do not add up (because of the absence of a comprehensive conceptual framework) they amount to nothing more than a disconnected mosaic of partial remedies.

Many people, dissatisfied with the theoretical weaknesses of the ecology movement, and also alarmed by the fact that it seems to have made but little difference to the world at large, decided to do something more concrete and more practical — hence, first the interest in, and then the fascination with, ecological gadgets. Other people, who had hoped for an instant revolution, got discouraged, opted out and faded away; or simply acquired a taste for the goodies of the 'rotten outside world'. In both cases the disenchantment was the result of an insufficient re-thinking of the roots of our present problems, and insufficient realisation that it is not enough to have new gadgets in order

to create an alternative lifestyle for the whole of society.

We, as human beings, leading individual and social lives in a given society at a given time, are embedded not only in a specific technology with its specific processes of production (the instruments, machinery and so on) which make up the most visible wheels and bolts on which a given society moves. We are also embedded in the envelope of knowledge which provides the basis for a given technology and justifies it rationally; in the envelope of values which subtly and compellingly controls our uses of knowledge and technology; and in the envelope of theology, be it religious or secular, which binds together and gives a specific shape and élan to all other envelopes. We should be perfectly aware that theology is not a thing of the past. We must not be so presumptuous as to assume that our scientific age is free of it. Thus we must be aware of the existence of the theology of Material Progress, which so often binds and defines the course of our thoughts and actions, while we are hardly aware of it.

The ecology movement has pretty well come to grips with the technological envelope, which is the most visible of all. It has to some extent come to grips with the en-

velope called knowledge, namely by realising that no knowledge is neutral; and furthermore that knowledge is not only the basis of our technology, but also the basis of our cosmology, that is, our world view. The relationship between knowledge and cosmology is vital within any world view. We know what this relationship is within the present scientific world view. Science is the backbone of our knowledge, and indeed of our world picture. But we are still unclear about what changes in our knowledge are required to make it compatible with ecologically sound technology, and moreover, what kind of cosmology or world picture will be implied by these changes in our knowledge. What I am suggesting is that we shall have to change both the basis of our knowledge and our world picture simultaneously. The ecology movement has made few inroads in re-thinking the value basis, or the envelope called values, which would be compatible with the new technology and with the new world picture. It has perhaps made even less progress in working out a new envelope called theology.

Among many ecology minded people, particularly those occupied with windmills and solar collectors, such concepts as 'values' and 'theology' are alien, if not considered spurious. But unless these four envelopes are re-thought together (theology, values, knowledge and technology), the ecology movement is bound to be ineffective and frustrated in the long run. I am not saying it is bound to fail, for whatever it has *not* accomplished, it has already succeeded — that is, in one profound sense — in making us aware of our thoughtlessly consumptive attitudes. The ecology movement *has* succeeded in making us see the negative aspects of the present socio-economic paradigm, indeed, the negative aspects of the whole western, materialist, consumptive civilisation. But it has not succeeded in its positive role, in instilling in us new positive attitudes. This, I have argued, is the result of its theoretical weakness, its inability to work out a comprehensive philosophy related to the four envelopes I have discussed: theology, values, knowledge and technology. A concern with these larger aspects, with its foundations, so to speak, is sometimes brushed aside by the ecology movement as mere 'philosophising', as something unimportant. But in fact (as I have tried to argue) it is of the utmost importance.

Ecology people often emphasize that nature works as a vast interconnected system, infinitely subtle but kept in an equilibrium by a large number of interlocked balances. It is time that they realise that this is no less true of society and human life: they too operate within a subtle network of balances. Within this network our ideas and ideals, our knowledge and theology are not mere ornaments but vital forces which make us think about the world, about society, and about ourselves in a certain way; and they make us *do* things in a certain way, which in the long run leads to specific consequences: the devastation of our natural habitats, the devastation of our health, or the enhancement of both. Thus, our ideas and ideals are the most lethal 'technological' weapons because they control, direct and justify all other strategies, technologies and weapons. Knowledge and ideals are condensed into symbols. Those symbols are the tools that define and determine our existence, our status, our horizons, our scope as human beings.

The philosophical limitations of the ecology movement seem to affect not only its pedestrian acolytes, but also the luminaries who are associated with the movement. Take Ivan Illich, for example, that enigmatic iconoclast, mesmerising people with his intelligence and always biting in his criticism of existing society. When one thinks of it, however, he is rather short of positive answers, particularly when it comes to values and theology, which alone can justify all other answers. Is it so, in his case, by a conscious design — to avoid values and theology as something private (which is rather foolish because values and theology in the real world cannot be and are not private), or is it so by virtue of an inability to work out a comprehensive basis for his convivial society?

E. F. Schumacher is also lamentably inadequate when one probes deeper into the foundations of his *Small is Beautiful*. Is *small* an entirely aesthetic category? It seems that the theology of 'small is beautiful' is beginning to petrify before it has had a chance to bloom and be developed.

I really should emphasize at this point that my critique of the ecology movement is a critique of its inadequacies, not a critique of its *raison d'être*. I fully concur with the main (negative) thesis of the ecology movement that society (and western civilisation) are in bad shape, which

is the consequence of our exploitive and parasitic practices *vis à vis* nature and *vis à vis* other people. And I wish to disassociate myself from the critiques of the ecology movement made from the position of the *status quo*, which, more often than not, assume that there is nothing basically wrong with the world as it is, but that there may be something 'kinky' about ecology people.

The ecology movement is not the first of its kind to decry the destructive tendencies of western technical civilisation. From the middle of the 19th century, the voices of despair over civilisation have been frequent and persistent, as witness Frederick Nietzsche, Oswald Spengler and some surrealist poets. These earlier critics of civilisation, the forerunner of whom was Jean Jacques Rousseau, bemoaned the destruction of values and culture and the rising tide of philistinism. There is however something distinctly novel about the contemporary ecology movement. For whereas the early critics concentrated on the software of civilisation, so to speak, on values and culture, the ecology movement has directed its attention to the hardware of civilisation, to its economics and technology. The ecology movement has shown that the economics of exploitation goes hand in hand with high-power technology, and that the two are the wheels of the vehicle of Progress, whose one face is industrial efficiency, and whose other face is ecological devastation and the de-humanisation of working conditions and of human habitats.

Both critiques of civilisation, of its software and its hardware, are only partial, and none is adequate. In order to succeed, the ecology movement must combine its critique of the hardware with its creative critique of the software of civilisation; and above all, it must evolve a positive programme which must be established firmly in a comprehensive philosophy. This philosophy may be called the ecological outlook. The *ecological outlook* then will have to become a new consistent vision of reality, in which the various aspects of the world view now known as the scientific outlook are creatively redefined. We must be perfectly aware that that scientific outlook, which we have inherited from our forefathers, from our schools and academia, and also from the mass media is a whole set of doctrines about the world, about nature, about ourselves and other human beings.

Notebook

Our Vanishing Trees

The 1973 "Tree Year" begins to look more and more like a sick joke. Three years and two summer droughts later, it would be interesting (and doubtless depressing) to know what percentage of the 1973 generation remains alive. Certainly young trees are dying in thousands, if not millions. Some tree-owning authorities have woken up to the danger and are taking action — Northampton is using sewage effluent to save 4,000 trees planted last winter, and one Sussex authority is bringing water by tanker from a flooded gravel pit. But such emergency measures only point up the the enthusiastic ignorance of much tree-planting: despite an abundance of expert advice, too many people still apparently believe that all you have to do to plant a tree is stick it in a hole and leave it to grow. The withered victims of this misconception may now be seen in every town and village in the country.

But the "Plant a Tree in '73" campaign was in any case little better than a palliative. A proliferation of flowering cherries on municipal recreation grounds is hardly adequate compensation for the continuing erosion of the native species of woodland and hedgerow. For them, things have never looked blacker. The combined assault of man and nature is causing damage which will impoverish this country for a century to come. Drought, fire and disease are killing more trees than ever before; what hedges survive are generally cut by machines which decapitate the saplings the old-time hedgers would have spared to grow tall; the economic crisis has cut public expenditure on trees, and Capital Transfer Tax has had a disastrous effect on private planting. Perhaps most serious of all, the ancient woodlands of Britain — ecologically, historically and aesthetically by far the most precious — have been devastated in recent years by agricultural and other "development", not least the activities of the Forestry Commission. One recent estimate is that about a third of all woodland dating from before about 1700 has been destroyed since the last war (see Oliver Rackham, *Trees and Woodland in the British Landscape*, Dent, 1976).

The catastrophe is on such a scale that piecemeal solutions are unlikely to succeed. Some government action seems essential. Trees need to be officially recognised as a national asset, and measures taken to protect existing ones and encourage the planting of many more. The Forestry Commission, despite its many past imperfections, is the obvious body to be entrusted with coordinating these measures — but its terms of reference obviously need to be shifted, far more than has happened yet, away from the pursuit of short-term profits towards a concern for the total environment of which trees in all their variety form so useful and delightful a part.

We Told Them So

Good news from the Transport and Road Research Laboratory. Their latest annual report reveals that road travel was only about 1½ per cent higher in 1974 and

the first half of 1975 than in 1972, as opposed to an increase of 8 or 9 per cent predicted on the basis of past trends. Is it too much to hope that the Ministry of Transport will read the report and at last acknowledge, what we have been telling them for years, that the present road construction programme is based on out-of-date and wildly exaggerated estimates of the country's future needs?

A Dangerous Argument

I am not a vegetarian: and I have always found the arguments in favour of vegetarianism on grounds of health and anthropology unconvincing. (The ethical vegetarian is on firmer ground — though I personally feel that any domestic animal who is given a pleasant life and a quick death has been paid a fair price for the subsequent use of its body.) But in recent years a new argument has come to the forefront of vegetarian propaganda — that in an overcrowded and undernourished world it is immoral to give to animals food which could be consumed directly by human beings. Meat-eating is a luxury we can no longer afford.

The case is not an easy one to refute. Meat-eating is a luxury: the grain which supports one cow in England would no doubt maintain an Indian family in modest affluence. And in an emergency it is obviously right that the rich should forego their luxuries rather than deprive the poor of their necessities. But have the vegetarians thought out exactly where their argument ultimately leads? If meat is a luxury, so, relatively speaking, is almost every other food except cereals and pulses. Take Vitamin C, for example: you can get

new from Manchester

STUDIES IN ENVIRONMENTAL POLLUTION

THE ESTIMATION OF POLLUTION DAMAGE

P J W Saunders Scientists, economists and administrators are all involved in the controlling of pollution, but a major problem in such work is the difficulty in estimating its effects; without reliable estimates of the damage it causes, national control of pollution is impossible. In this study Dr. Saunders defines the basic methods of assessment in the field and laboratory, and identifies the features of such work that are common to most or all types of pollution providing a detailed chapter on technical methods for those engaged in practical work. £6.95 net

TOWN PLANNING AND POLLUTION CONTROL

Chris Wood Armed with a knowledge of pollution and its control, together with a wide range of largely unrecognised powers, the planner can and should make a significant contribution to improving environmental pollution levels. This book reviews the pollution process, outlines the powers and responsibilities of town planning, analyses planning as a method of control and describes the techniques available to the planner in controlling air, noise, water and land pollution. Illustrated £7.95 net

Series leaflet available on application

MANCHESTER UNIVERSITY PRESS
Oxford Road, Manchester M13 9PL

your daily requirement of that from a handful of raw cabbage or half a pound of boiled potatoes, so what possible justification is there for taking up valuable agricultural land growing oranges or blackcurrants? The world could easily support, on a dull but adequate diet, several times its present population. But is this the sort of world anybody really wants? The danger of extreme measures in an emergency is that they tend to be perpetuated indefinitely: *income tax* began as an "emergency measure". Mankind must be offered something better to strive for than mere survival in a world where all the harmless traditional extras of life have been outlawed as superfluous luxuries.

Protecting Birds of Prey

Golden eagle and peregrine falcon fledglings stolen from the nest for sale to would-be falconers; osprey eggs taken by misguided collectors; over 200 buzzards shot or deliberately poisoned in a single year on just four Highland estates. These are just a few examples of what it is like to belong to a "protected" bird species in modern Britain. It is ironic that, after the side-effects of pesticides, the most serious threat to our birds of prey should come from people who would probably describe themselves as bird-lovers. "Education" of potential offenders seems, in the circumstances, unlikely to succeed — they must already know very well what they are doing. The law must take a hand: and since it is manifestly a dead letter at present it must be reinforced.

Even with the recent increases in fines for offenders, the Protection of Birds Act simply does not impose sufficiently severe penalties. But even the pillory and the gallows would be unlikely to have much effect without adequate means of enforcing the law: so it is good to know that the R.S.P.B. has plans for far closer supervision of nest sites next year. Further changes in the law are also needed — in particular, a licensing system to control ownership of birds of prey, and provision for punishing the employers of trigger-happy gamekeepers whose habit it is to shoot on sight anything with a hooked beak.

Unacceptable Risks?

The "Genetic Manipulation Advisory Group" sounds like an alarmingly Huxleyan body. It is symptomatic of the distance we have now travelled along the road to Brave New World that such a group is actually to be set up. Its establishment is one of the recommendations of a Government working party which reported recently on the new techniques for genetic experimentation. The main function of the proposed Group would be to "advise on appropriate precautions for the conduct of experiments".

The breakthrough which has made this necessary occurred about two years ago, when microbiologists discovered a way of combining genes from two different species, thus in effect producing entirely new organisms. The creation of "Frankenstein" monsters in the laboratory is mercifully some way off yet (though it is tempting to speculate on the verbal contortions scientists would employ to justify that sort of experiment!). But the immediate prospect is almost equally disquieting. Frankenstein's creation was a single individual, large enough to be killed by a bullet: the products of today's experiments are bacteria or viruses — let them once escape from the laboratory and we're stuck with them for keeps.

It is, of course, to avoid accidents of that kind that the working party has made its recommendations. But it is an unfortunate fact of life that safety precautions, however stringent, are never in practice 100% effective. Accidents, as I had occasion to say in another context last month, *will* happen: and it is no mere scaremongering to suggest that an accident in this type of work could unleash upon the world a new Black Death immune to existing drugs.

The only really effective precaution would be a pledge by scientists not to engage in work of such potential destructiveness. Claims about the ethical neutrality of science and the absolute right to advance the frontiers of knowledge in every direction have been looking rather threadbare for a long time now. The haphazard nature of much genetic research makes such a high and mighty approach particularly inappropriate. The working party's report begins with the recommendation that such experiments "should be encouraged"; to the non-scientific layman, this value-judgment is by no means self-evident. Is it, perhaps, time that scientists had to prove the need for novel experiments, rather than assuming that anything is permissible unless it is actually prohibited?

What Would Virgil Say Now?

"It is often beneficial to set fire to unfruitful fields and burn the light stubble with crackling flames." The advice comes from Virgil (*Georgics* I, 84-5); and I quote it merely to show that a practice which has attracted so much adverse publicity in recent years can boast, on the face of it, a respectable antiquity. Whether Virgil would have approved of the activities of

This Month's Authors

Peter Springell

is Chairman of the Capricorn Conservation Council and is connected with a number of other conservation bodies. He emigrated to Australia after graduating from Cambridge University and his interest in conservation dates from a visit to Cornell University in 1969/70.

Eric Waddell

is an Associate Professor in the Department of Geography at McGill University, Montreal, and was firstly a Research Scholar and later a Visiting Fellow in the Department of Human Geography, Australian National University, who financed the research upon which *How the Enga Cope* with Frost was based.

Henryk Skolimowski

is Professor of Philosophy in the Department of Humanities at The University of Michigan and visiting Professor at St. Antony's College, Oxford. His main interest lies in the development of a post-industrial ethic and a post-industrial society. He is an Associate Editor of *The Ecologist*. His monograph *Ecological Humanism* will be published by The Gryphon Press this autumn.

Molly Townsend

is the great-great-great-great niece of William Cobbett, and currently lives between Farnham, Surrey (where Cobbett was born and raised) and Botley, Nr. Southampton (where he lived and farmed 1805-1820). She read Economics and Sociology at L.S.E. and later worked at the Tavistock Institute in the Child Development Research Unit. She is the co-author, with Capes and Gould, of *Stress in Youth*, O.U.P. 1971.

our modern agricultural pyromaniacs is another matter altogether. The issue is clouded somewhat by the persistent references in the press to burning *stubble*. To do this, at any rate with the short stalks left by hand reaping, might well be on balance beneficial. But the modern farmer, more often than not, is burning whole straw: and the major objection to the practice is not the air pollution and the risk of fires spreading, but the waste of a valuable by-product.

As usual, modern economics (even at its most well-meaning) can only offer a hopelessly roundabout and unpractical solution — to transport the straw across the country, from the arable south and east where it is regarded as rubbish, to the pastoral north and west where it is desperately needed as fodder and bedding. (In France, apparently, such an operation has actually been mounted by the National Railways.) As an emergency measure, this may even be justifiable. But could anything highlight more dramatically the fundamental folly of modern over-specialised farming?*

An Ecological Defence Policy

Defence has not so far been a topic on which the ecological movement has had much to say. We are all against nuclear weapons, chemical and biological warfare, and all the other horrors that modern science can produce when it's really *trying* to be nasty: but we don't seem to have felt it was our job to work out an alternative policy for national survival in a world full of aggressive enemies. Pacifism and non-violent resistance, of course, provide one answer, *morally*, no doubt the best, but demanding an abnormal degree of courage, commitment and solidarity to make it feasible on a national scale.

But there is another alternative. A defence policy which is decentralist and technologically unsophisticated is a practical possibility — and it has the added advantages, which even our present Government might recognise, that it would be cheap and in all likelihood reasonably effective. Indeed, it seems admirably suited to a nation which has finally abandoned its pretensions to world-power status. It is the subject of a recent book by Adam Roberts (*Nations in Arms: the Theory and Practice of Territorial Defence*, Chatto and Windus, £7.50). Mr. Roberts takes as his models Yugoslavia and Switzerland, countries which have in common a passionate commitment to neutrality and a recognition that in a wicked world you have to be tough to *stay* neutral. Both nations base their defence on a citizen militia, to which virtually all able-bodied men belong. (Yugoslavia, unlike Switzerland, does also have a full-time professional army.) Regular training ensures that the part-time soldiers are reasonably efficient. They are no possible threat to any other nation: but they present to any potential invader the certainty of a long and expensive struggle against numerous, experienced and well-equipped guerrillas. Britain's present defence policy is crippling costly and of doubtful effectiveness: has the time come for a really radical reappraisal?

Nicholas Gould

* The problem of slurry is another consequence of this folly: on a mixed farm the manure from livestock and the straw from cereal crops combines to produce what has always been one of the most valuable assets of the farm — the rich farmyard manure which, returned to the land, restores the humus taken from it. The notion of slurry as waste would have been inconceivable to a pre-war farmer. — Editor.

The Gryphon Press



TRACT is independent, unsupported by government grants and commercial advertising.

It seeks to draw into a living unity the best ideas of our time.

The journal ranges from architecture to psychotherapy, from science to politics, from poetry to ecology.

It has been described by the New Era as "the most stimulating educational publication at present available in this country."

TRACT

Back Numbers of the following issues are still available —

- | | | |
|---------------------------------|--|-----|
| TRACT 6 — | Language, Freedom and the Imagination by John Adams | 25p |
| TRACT 7 — | Neurosis as a Moral-Existential Phenomenon by Dr. E.K. Ledermann | 25p |
| TRACT 8 — | Science and Belief by Christopher Small | 25p |
| TRACT 9 — | The Archetypal Context of Political Experience by W.H. Allchin | 25p |
| TRACT 10 and 11 (joint issue) — | The Politics of Education — A Symposium | 50p |
| TRACT 12 — | The City as Convivial Centre by Leopold Kohr | 50p |
| TRACT 13 — | On Creative Thinking by Marjorie Hourd | 50p |
| TRACT 14 — | The Three Faces of Humanism by Dr. Catherine Roberts | 50p |
| TRACT 15 — | Towards a Critique of Industrial Culture by Seymour Betsky | 50p |
| TRACT 16 and 17 — | The Challenge of Existentialism — A Symposium | £1 |
| TRACT 18 — | The Primitive and the Civilized by Stanley Diamond | 50p |
| * * * * * | | |
| TRACT 19 — | Ecological Humanism by Henryk Skolimowski | |

ECOLOGICAL HUMANISM by Henryk Skolimowski

is the title of the most recent issue of *Tract*. In this, the fifth birthday issue of this independent journal, Henryk Skolimowski argues the need for a coherent and passionate philosophy to underpin the ecological movement. The author argues that without a broad philosophical base the current interest in ecology will quickly deteriorate into a variety of fads and a narrow preoccupation with different forms of gadgetry. This double issue of *Tract* thus provides essential reading for all those interested in maintaining a broad and dignified concept of ecology.

Copies of *Ecological Humanism* (£1 each) and further details about *Tract* publications can be obtained from:

The Gryphon Press,
38 Prince Edwards Road,
Lewes, Sussex.

TO THE GRYPHON PRESS, 38 PRINCE EDWARD'S ROAD, LEWES, SUSSEX.

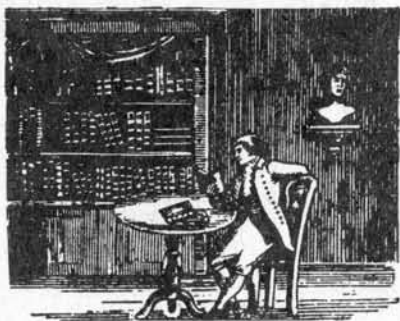
I ENCLOSE £2.00 for a Year's Subscription to TRACT. Overseas £3

I ENCLOSE
for back numbers

Name

ADDRESS

.....



Books

Being Nice to the Nasties

INVISIBLE ALLIES: MICROBES AND MAN'S FUTURE

by Bernard Dixon. Maurice Temple Smith Ltd. £4.

The smallpox virus may be extinct. The WHO's campaign to eliminate smallpox, justly claimed as its greatest triumph, has proceeded rapidly and inexorably toward the annihilation of a parasite whose only host is man. The human race is better off without smallpox, but is it better off without the smallpox virus, even preserved in some kind of microbial museum? The question may sound silly until you reflect that although man has brought many species to extinction this is the first time he has done so deliberately.

It raises issues of great concern to Dr. Dixon, who points out that "simple" though this virus may be, it is far more complex than anything ever made by man. Should it vanish there is not the remotest chance that we could re-create it should a need arise: and who are we to say that a need will never arise?

There is no boundary that can be set logically to the conservation of threatened species. What applies to one applies to all, so that if we believe the blue whale worth saving, or a rare butterfly, then we cannot argue against similar protection of a microbe.

Nor would we, were it not for our attitude toward microbes in general. We regard them as inherently evil, probably on the grounds that something too small to see must be up to no good. So we attack them with deodorants and antiseptics and should we fail to kill the 99 per cent the advertisements promise so that a harmful one — the only ones we care about are the harmful ones — survives, then the doctor will give us a more powerful weapon with which to belt it. There is no doubt we would kill off the whole tribe if we could.

The truth is that the vast majority of microbes are benign, some are necessary to our very survival, and many more make life more pleasant than it would be without them. We recruited some yeasts very early in our history and have been boozing and eating leavened bread happily ever since. Dr. Dixon has a detailed knowledge of yeast fermentation and he describes lovingly the production of wines and beers. It is good to know that when it comes to living with microbes the intelligent microbiologist has it made. This is only the start, however, and once you have admitted your dependence on your gut flora, on the micropopulation of the soil, and on bread and wine, you are hitched firmly behind the author's white charger as he races to the defence of his (and our) invisible allies. The list of contributions made by fungi and bacteria to the growing and preparation of foods extends for miles to right and left and it can be extended further still if we overlook momentarily the fact that at present we are not short of protein and allow meat analogue mountains to accumulate from the growth of various microbes on feedstocks made from anything you can think of. As the price of fossil fuels and many minerals rises, microbes can be employed as miners to extract metals from low grade ores cheaply and without disturbing the surrounding environment. A whole range of industrial commodities, especially chemicals, can be produced microbially. Many were until oil became cheap and plentiful.

Even the part played by microbes in disease has been exaggerated. It is not in the interest of any parasite to kill its host and many virulent diseases begin as accidental encounters between organisms and a new, unprepared host. Allowed to run their course, diseases often change to milder, endemic forms that permit the parasite population to multiply and survive. Though the first encounter was not accidental, the classic modern example is myxomatosis in rabbits, which is now endemic but no longer lethal. It can work the other way too, as when improvements in hygiene deprived small children of exposure to the common polio virus, leaving them susceptible to more damaging exposure later in life. Dr. Dixon shows how the germ theory of disease became a dogma, but never explained how it was that in even the most severe epidemic many individuals remained unaffected. He quotes the strange experiments of von Pettenkofer and Metchnikoff who, together with a number of their

colleagues, swallowed tumblersful of cultures isolated from dead victims of cholera. Some developed mild diarrhoea, but none suffered from anything resembling cholera. Yet a few cases of typhoid can send whole nations into hysterical condemnation of germs and all their wicked brood and although it appeared after this book was written, our present fear of rabies is almost rabid. Even in countries where rabies is endemic, cases in humans are very rare indeed. It is sensible to keep it out of the country if we can, but there has been talk of destroying large numbers of wild animals.

Henceforward Dr. Dixon may come to be regarded as a PRO, or ambassador, for microbes. Probably he will not mind, for what he says, unequivocally and authoritatively, needed saying.

Michael Allaby

Doomed by Discovery

THE GENTLE TASADAY. A Stone Age people in the Philippine rain forest. By John Nance. Foreword by Charles A. Lindbergh. 465 pp. Illustrated. Victor Gollancz. £6.00.

The discovery of the Tasaday, a previously unknown tribe of hunter-gatherers on the island of Mindanao in the Philippines, caused a major international sensation. Their purity, lack of any knowledge of metal or contact with any other peoples, their charm and gentleness captured the imagination of the world and to a large extent both overshadowed and focussed concern for primitive minorities elsewhere. And yet there were only 28 of them. From the first moment they were contacted it seemed unlikely that they would be able to survive the shock, and deep concern was felt by many as news filtered out of their being examined, questioned and introduced to aspects of the technological world. Surely, if ever there was a case for leaving a people alone this was it. Living on wild fruit and vegetables, fish, frogs and tadpoles, without any apparent warlike tendencies or tribal practices unacceptable to conventional ethics, they came to symbolise for many the isolationist argument. Why should they be destroyed by integration? What possible benefits could civilization bring them?

Unfortunately reality is never as clear cut as this on an overcrowded planet and cognizance must be taken of the many threats already faced without their knowing it by such a people. The fact that logging con-

censsions had already been granted over their lands; that once their existence was known other outsiders would feel impelled from a variety of motives to visit them; that contact itself had changed their lives irrevocably and set in motion a chain of events which they would need sympathetic help to handle.

John Nance's book tells of the first three years of contact in considerable detail. The handful of Tasaday emerge as remarkable individual characters with a charm and beauty which clearly overwhelmed all who met them. It is hard to be unromantic and clinical in the face of such innocence. Although many might feel, reading the book, that it would have been better had they never been discovered, some good did result. A reserve of 49,299 acres "forbidden to outside exploitation, entry, sale, lease or other disposition" was created around them. The Philippine government's policy was restated, committing the administration to "integrating those minorities who wish to join the mainstream of Filipino national life and protecting the rights of those who prefer to remain and preserve their original life ways". Perhaps most important of all, the publicity given to the discovery stimulated international concern over the fate of all primitive minorities, leading scientists to make such statements as that "one great value was that the Tasaday might help civilized man to understand better what they had gained by knowing what they had lost."

Apart from the Tasaday one other personality dominates this book; Manuel Elizalde founder and head of PANAMIN (Private Association for National Minorities) without whose commitment to the tribal people of the Philippines (some 4,000,000 out of a population of 39,000,000) most of the events recorded would not, as the author says, have taken place.

Attempting to understand the motives and mental processes of this powerful but clearly much misunderstood man is in itself a fascinating part of the book. While the Tasaday are, and will probably remain, like outer space, an enigma beyond normal comprehension, he is a product, albeit rather an unusual one, of our familiar society. The future of the Tasaday lies largely in his hands and he is committed to protecting them, an almost impossible task. A few weeks ago, for example, I heard a journalist on BBC Woman's Hour describing how she had paid them a visit and what fun it had been playing with them in their innocence.

Robin Hanbury-Tenison

Paperback Reprint

FOOD FOR A FUTURE: The Ecological Priority of a Humane Diet. Jon Wynne-Tyson. Abacus 95p.

At a time when increasing numbers of people are prepared to consider the case for a vegetarian diet more seriously than at any previous period in our history, it is a pity that the sub-title does not appear on the cover of the paperback edition. As a title *Food for a Future* gives little indication of the breadth or depth of its subject matter. It is in fact a cogently argued and fully documented exploration of the reasons why we should re-examine our traditional eating habits.

On health grounds Jon Wynne-Tyson argues that we are not physiologically designed to be meat eaters — many will of course disagree, but he has assembled plenty of evidence to support his thesis that a diet free of animal products is better for us (and incidentally more economical) than a diet based on meat, fish, poultry and dairy foods. This section contains comprehensive dietetic information which should go far towards eliminating any lurking doubts we may have about our 'need' for meat.

An argument that becomes increasingly familiar as fears of world famine are seen to be justified by hard facts, is the economic, ecological and moral indefensibility of feeding vast quantities of cereals and oil seeds to livestock so that the population of affluent nations may continue to eat meat daily, while the other two thirds of the world face starvation.

Jon Wynne-Tyson is a passionate advocate of the vegetarian cause; he has marshalled a strong case with abundant facts and many witnesses to support it, and demolishes, one by one, the better known arguments against his thesis. It is fair, I think, to assume that his book is addressed to the unconverted, and it would perhaps have been wiser to avoid alienating those prepared to give him a fair hearing, by his doubtful assumption of wilful stupidity — in those not yet of his persuasion. But after the hectoring and the proselytizing, we are led at last into calmer waters, with a short and absorbing look at the teachings of religious leaders and philosophers of the past. Here, in a more reflective mood we have time to realise what a very good writer Mr. Wynne-Tyson is.

RL-S

CONSERVATION BOOKS

GIFT SETS

GIFT SET 3: reduced from £5.75 to £1.50. 1970s: Decade of Decision Conservation Society; A Huxley; The Sundance People (Plains Indians: their culture and struggle to survive) R Erdoes.

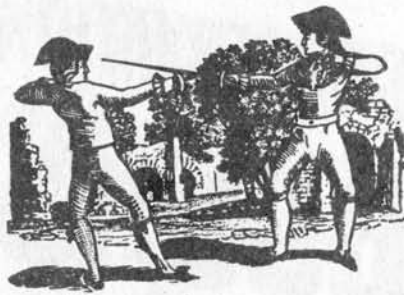
GIFT SET 4: reduced from £8.75 to £3.80. Our Fragile Earth E S Helfman; Plant & Planet A Huxley; The Sundance People (Plains Indians: their culture and struggle to survive) R Erdoes.

NEW STOCK

Ecological Paper Buying	C Cohen, FOE	£0.35
Guide to Secondary School Environmental Action (2nd edn)		£0.25
The End of Affluence	P R & A H Ehrlich	£1.20
Environment & Industrial Society		
	N Holmes (Ed)	£2.95
Man-Made Futures	(Open University)	£3.25
The Control of Technology	R D Elliot	£3.50
The Promise of the Coming Dark Age		
	L S Stavrianos	£3.40
Land for the People	H Girardet (Ed)	£1.20
Nature, Mother of Invention F Paturi		£4.95
Anarchy in Action	C Ward	£1.75
Power, Money & Sex: Towards a new social balance	J Robertson	£2.25
Business Civilisation in Decline		
	R L Heilbroner	£1.95
Business Strategies for Survival: Planning for social and political change		
	C Hutchinson/J Robertson/et al	£6.50
The Economic Superpowers and the environment	D R Kelley/et al	£3.80
Applied Ecology: A nontechnical approach	A D Hinkley	£4.75
Planning or Prevention? The new face of family planning	P Diggory/J McEwan	£1.95
In the Human Interest: A strategy to stabilise world population	L R Brown	£5.50
By Bread Alone	L R Brown/E P Eckholm	£4.50
The Politics of Food	D Green	£5.00
Wastage in the UK food system		
	R Roy, FOE	£0.75
Man & Land: The fundamental issue in development	E H & C F Jacoby	£4.75
Report from a Chinese Village	J Myrdal	£1.00
Energy: The case for conservation	D Hayes	£1.00
Man, Energy, Society	E Cook	£5.00
Nuclear Power: The fifth horseman	D Hayes	£1.00
A House for the Future	T P McLaughlin	£0.99
An Introduction to Heat Pumps	J A Sumner	£1.25
International Economics of Pollution		
	I Walter	£3.95
Pesticides: Boon or bane?	M B Green	£2.95
Planning for Public Transport	P R White	£2.95
Introduction to Transport Planning		
	M J Bruton	£2.95
Townscapes	G Burke	£2.25
Housing by People	J F C Turner	£2.25
The Future of Cities	(Open University)	£2.75
Citizens in Conflict: Sociology of town planning	J M Simmie	£2.75
An Introduction to Regional Planning		
	J Glasson	£2.75
The Backyard Poultry Book	A Singer	£1.50
Background to Beekeeping (2nd edn)		
	A C Waine	£3.75

500 titles stocked; any supplied. Large SAE for classified stock list. Please send full payment including P & P (UK orders up to £1: 30%; £1-3: 20%; £3-6: 15%; £6-10: 10%; over £10: free.) and VAT (8% of P & P amount only).

Conservation Books [E].
228 London Road, Reading, Berkshire, RG6 1AH.
Tel: Reading (0734) 663281.



Letters

Oiling the Wheels of the Doomsday Machine

Dear Sir,

It is far less certain than you claim that the world cannot support a population of six to seven billion. Certainly there would be no great technical problem in feeding a population of that size. The real problem is a political and economic one. Most of the people in the world who are hungry are hungry because they are poor. If work can be found for them a demand for food can be created that can be met by using the best of modern technologies, but using them with sensitivity. This requires assistance from the rich, but assistance given in the form most appropriate to local need and given when requested. Our failures in the past derived from a complex mixture of self-interest and an ideological zeal that sought to create in the tropics and sub-tropics nation states modelled closely on those of Europe and North America.

Aid is no longer conceived in the old terms. Everyone now is aware of the need to revise trade relationships that are loaded heavily in favour of the rich so that developing countries may be allowed to develop in their own ways toward lifestyles that may be very different from ours but which nonetheless eliminate the poverty that causes hunger.

Nor is it certain that diseases cannot be brought under control. The WHO achievements with malaria are greater than you suggest, although they fall far short of the complete eradication achieved with smallpox. Many demographers agree that the first step in reducing rates of population growth is to reduce infant mortality. The second step is to achieve a modest increase in prosperity.

If we pretend that problems are insoluble then we can rationalise our decision to do nothing to solve them. No action is possible, therefore there is no reason for changing in the

slightest our own way of life. Thus can we make prophecies that fulfil themselves and thus can we justify the privilege we enjoy.

You say, and in italics, that "Development is, in fact, the most callous confidence trick ever perpetrated by man. All its benefits are illusory while its costs are very real and very cruel". Modern surgery, since superseded by drug therapy, saved my life when I was six years of age. I cannot agree with you. In fact this statement is a wild exaggeration. Later you say that "WHO will in the end have increased not decreased the number of victims of this disease" (malaria). You cannot know this.

Perhaps, though, the proviso in your last paragraph redeems the human race. You advocate aid for all those countries that are trying to reduce their rate of population growth, or achieve a population size (in some countries an increase is desirable) that is in balance with their resources, and that are trying to become self-sufficient in food production, based on methods that can be sustained over long periods of time. That accounts for most countries. Most of them also entertain the notion that cities should be fit for humans to inhabit and are trying to make them so.

Yours faithfully,
Michael Allaby,
Associate Editor,
Wadebridge.

Whose Foot on the Ladder?

Dear Sir,

It was very pleasing to see your full and fair review of SERA's pamphlet *Jobs and the Environment*. I should like to comment on certain points you raise.

You make the case that, given Patrick Kinnersley's list of the tremendous hazards to human well-being which arise from modern productive processes, the 'wealth' produced does not allow enough surplus to finance adequate safety measures. Your case may indeed be an entirely valid one. But the introduction to the pamphlet states 'You will not find here a detailed programme of action'. That, I suggest, is the pamphlet's strength.

Patrick Kinnersley is stating the problem; it is up to the Labour Movement to fight for adequate safety measures. If a particular industry cannot then make itself safe, it may well become a casualty. Society will have to make do with a less toxic or less dangerous substitute. Here we see a mechanism of change.

I would contrast your publication *Blueprint for Survival*, which gives a vision and a programme, but does not suggest a mechanism for carrying out that programme other than a network diagram starting in 1975 (have the activities begun yet?). A network diagram of this type is a technocratic device: the machinery of technocracy is to be used, apparently, to phase out technocracy. This is as though one should politely ask a murderer to hang himself.

And so with Mike Cooley's demands for socially useful work. Although pressure by workers for products to fulfil social needs will not of itself usher in the millenium, it is bound (if successful) to trigger changes in the industrial structure of society. Of course the definition of 'need' is difficult. People may or may not need cars in Los Angeles, but I know of some old people who could make some good use of some of the heat that gigantic power stations pour out into the River Trent. And that is the sort of change that society could encompass, provided the pressure was strong enough.

Many environmental groups have explained why we must climb out of the self-destructive morass of our present technology. This pamphlet is unusual in that it gives actual instructions on how to put one foot on the bottom rung of the ladder.

Yours faithfully,
R.D. Oakley-Hill,
Treasurer, SERA.

Municipal Compost

Dear Sir,

It has been brought to my attention that the Leicestershire Compost Plant and myself, the manager, are being cited in the correspondence pages of your magazine in the debate on Municipal Compost. (February and March/April 1976.)

I have read the letters with interest and have become quite jealous of Mr. Lawrence Hills' ability to use phrases, as quoted by Mr. Waller, such as "digging 4 inches high groundsel into fertile garden soil is like throwing a side of beef into a tank of crocodiles — everything boils with fury, then all is still and little is left," a sight it has not been my privilege to witness.

However, as an engineer it is my job to deal in facts and I would like to explain the control procedure at Leicester. Every week samples of the finished Lescost are taken by the County Analyst's staff and these are bulked and analysed once per

	Ring Culture 100% Lescost	Tinned with Skins (random)	Tinned with- out Skins (random)	Fresh Sample (random)
Lead p.p.m.	0.4	0.3	1.5	0.14
Cadmium p.p.m.	Not det- ected	Not det- ected	0.1	0.06

month to obtain the average for the month. Random samples are analysed prior to windrowing and occasional analyses are carried out on fruit and vegetables grown on excessively strong concentrations of Lescost.

As Mr. Hills' letter, quite rightly, expressed concern with lead and cadmium content I shall use these as my examples. The analysis for the March output, the latest available at the time of writing, gave a dry sample result of 160 parts per million of lead and 4 parts per million of cadmium. The lead figure is considerably less than the "1000 p.p.m. or more" quoted by Mr. Hills. When the Lescost is applied to the ground it does, of course, contain moisture and this has a dilutant effect on the already low figures. As applied (including moisture) the lead content is 84.8 p.p.m. and the cadmium content is 2.12 p.p.m. The actual parts per million when 10 tons/acre of Lescost is mixed in with the top 6 inches of soil becomes 1.26 p.p.m. for lead and 0.03 p.p.m. of cadmium. This is the increase in the metal level to the soil. Lead occurs in 'natural' soils in the range of 2-200 p.p.m. and cadmium at 0.5 p.p.m. and average contents tend to be 160 p.p.m. for lead and 1.7 p.p.m. for cadmium. As your readers are aware, plants extract metals from the soil so the actual build-up will be even lower. May I offer the following table of the results of analyses on tomatoes.

From the above it is obvious that there is no problem with cadmium, and the lead content is considerably lower than for tinned tomatoes (skinless). I would also point out that we do not recommend growing anything in neat Lescost and we only use this method to get the heaviest concentrations possible for analytical purposes.

At present an analysis is being done on topsoil that was first treated with Lescost in 1967 (when the Plant opened) and when the results are obtained they will be as freely available as all the analysis figures given in this letter, which are extracted from the County Analyst's monthly

report. I would like to make it quite clear that all the analytical figures quoted apply only to Lescost and do not refer to any other Municipal Compost. I would also like to make it clear that the purpose of this letter is not to start an argument with Mr. Hills, whose motives and opinions I respect, but simply to set the record straight as regards the metal content of Lescost. I hope I have made it plain that these are in the 'trace element' range rather than in the toxic metal category and that Leicestershire County Council is acting in a responsible manner.

Yours faithfully,
E. G. Hughes,
Works Manager,
Wanlip Composting Plant.

Aid for the Power-Crazy Bureaucrats

Dear Sir,

In response to the debate that is currently on, regarding the merits of aid, may I, as a man who comes from one of the receiving countries, contribute my little bit? In defence of Mr. Gordon's 'callousness', may I say that the single great deterrent in the field of development has been aid.

While Mr. Gordon has argued that aid has often hindered considered development, and in doing so talks about deaths due to malnutrition and epidemics, may I say that the delaying of these deaths has hidden the fact that very little has been achieved in Third World 'development' other than making condemned children survive wretchedly. Mr. Gordon also talks about the misuse of aid largely being used to prop up regimes that have no interest at all in the people. India is a very good example of this, where the greatest aid being given to any Third World country is being squandered to bring about self-sufficiency in arms and luxury goods and on huge international airports. Meanwhile, those in power cynically exploit the benefits of aid which are confined to urban populations anyway. As one farmer remarked to me during my travels, it is more cruel to keep millions alive in abso-

lute poverty than to let them die. "We don't need artificial hearts and kidneys and cancer research — if we cannot survive our own stupidities, then we deserve to die and not to live." He favoured rather a structural change that would leave him the power to change his own environment. But instead we find that the mindless plundering of the villages continues, to support a minority of power-crazy bureaucrats living in big cities. One has only to compare investments in development of infrastructure to know how genuine a regime is in its promises, and all such studies in India point to a disproportionate growth in the urban areas at the expense of the rural poor. Today, the country has to impose 'discipline' in order to continue this distortion in 'peace'.

While it is true that the discontinuation of aid will produce huge protests from the so-called representatives of the Third World who arrive at meetings in their Mercedes Benzes and well-tailored suits, the decision to stop aid will nevertheless represent sanity. More so, definitely, than handing out licences to manufacture nuclear bombs! It will also do wonders for the peoples of the Third World who are in any case not involved in this development 'racket'. With aid there is little scope for feeling liberated; the man on the street has to carry the shame of dependency for the rest of his life, when indeed he could achieve success without external assistance. All that aid has done is to postpone, and in some cases even suppress, peoples' efforts to liberate themselves from mind-boggling poverty and its social effects. There cannot be any satisfactory solutions to problems in India unless and until people become militant and decide to solve their problems by themselves. Those in the West who argue loudly for more aid would restrain themselves if they realized that militancy will be that much more inhumanly suppressed through aid.

The argument that wars could be prompted by independent self-reliant gestures from Third World countries is indeed a credible one. Notice the American Government's reaction during the oil crisis. But, fortunately or unfortunately, the first step on the road to development would be to cut exports or at least decrease the present emphasis on exports. Exports are not really a pre-requisite for development; self-sufficiency is. The bias in international trading relationships would be considerably reduced if trading were to be done on the basis of *surplus*, not of *necessities*. Today

these sales are largely ones of distress and aid has merely gone to increase the quantity of the distress sales. If wars threaten such a process of development, one only hopes that saner voices will prevail to preserve the rights of poor peoples to choose appropriate roads for their welfare.

Of course, aid or no aid, the repressiveness and thoughtlessness of these regimes in the Third World countries is going to catch up with them one of these days. Aid will only delay the confrontations but not eliminate them. Meanwhile 'callousness' will help breed awareness that much sooner. As a man who is returning to join the fight for sanity, may I appeal for rather *more* 'callousness' and *less* well-intentioned, but misplaced, kindness!

Name and address withheld for reasons of security.

Tragedy and Waste on Spanish Farms

Dear Sir,

Since the publication of my article "Is Time Running Out for the Spanish Farmer?" in the July issue of *The Ecologist*, the situation has become very much worse.

In Murcia Province the apricot harvest was a very good one this year, but the farmers could not sell it because the prices at source were so low that they did not pay the cost of the hand-picking necessary for this fruit. As a result many of the farmers have decided to uproot the trees in favour of more profitable crops. In the Lerida Province, famous for its wonderful pears, the farmers were forced to destroy 40 tons odd of fruit recently, again because the prices offered to them were so low that they did not cover the expense of the labour required to collect the crop.

On the other hand the French Farmers' Union has sent a secret document to all the Common Market Governments, explaining why it would be against their interests if Spain were allowed into the Common Market, because of her enormous agricultural potential. I have seen this document and in it they say that Spain could easily put into cultivation four times as much land as at present, in which case she could easily sweep the markets from under the French farmers' feet. It is for this reason that the French have recently refused to hold a meeting with Spanish farmers to discuss a general policy — they are simply

scared stiff — every week we hear reports of lorry loads of fruit from Spain being set upon by French farmers and their contents destroyed, and at the same time Spain actually imports milk from the South of France.

Meanwhile the middlemen are making enormous profits on fruit and vegetables, for example the apricots for which the grower is paid five pesetas a kilo (if he is lucky) are sold in the shops for 67 pesetas. Now these same middlemen have come up with a new trick — the monopoly racket. Recently I tried to sell the produce from our two farms to a local shopkeeper direct — thus cutting out the middleman altogether. He told me frankly that he dared not buy from me, because if he did so, then no wholesaler in the town would sell him anything else he needed. The same is true of the grain crops — the farmer gets about 7½ pesetas per kilo for his barley, corn etc., and once it has gone to the big combines he has to *pay* that price for the bran alone.

Not long ago a housewife bought a lettuce and complained when she had to pay 20 pesetas for it in a shop. When she got home and started to prepare the lettuce for a salad, she found a tiny piece of paper tucked into the heart of it, which read "They paid me 2 pesetas for this lettuce."

A couple of years ago we offered the Spanish Ministry of Agriculture some seeds of a new hybrid tomato we had developed in our laboratory here, which is practically all flesh, little juice and keeps like apples, for months if stored properly. Its shape makes it admirable for canning purposes, for which they are now using it in Canada. The farmers tried it out and were very pleased with it, but the middlemen refused to buy the crops on the grounds that the fruit kept too well.

Unless something is done to right these wrongs the whole economy of the country will break up. If food were cheap — as it could be in Spain — there would be fewer demands for higher wages, fewer strikes and more work well done all round.

Yours faithfully,
David Greenstock,
Director, Biological Research
Laboratory, Colegio de Ingleses,
Valladolid.

Conservation News



THE CONSERVATION SOCIETY AND THE CRISIS

Like every other organization of its type, the Conservation Society has been very badly affected by the ravages of inflation. Paper, printing and postage have all soared in price over the past year.

To meet these additional costs incurred in its day to day work the Society must increase its income.

Regrettably this has had to be done partly by increasing subscriptions, but to have placed all the burden on existing members would only result in more allowing membership to lapse, and thus set up another vicious circle. Most of the extra income needed must come from gaining new members.

We are asking our members to help in this, but perhaps you also know a friend, relative, colleague or neighbour who has expressed views which suggest that he or she might be interested in learning more about the Society. Such a person should at least be offered a Society leaflet, either directly by hand, or indirectly with a "Thought this might be of interest" note attached.

We will supply leaflets and membership application forms free on receipt of a stamped, self-addressed foolscap envelope.

Please write to:

The Director, The Conservation Society Ltd., 12 London Street, Chertsey, Surrey KT 16 8AA.

Classified advertisements

DISPLAY ADVERTISING

1 page 261 x 185 mm	— £90
½ page 131 x 185 mm	— £50
⅓ page 131 x 121 mm	
or 261 x 58mm	— £35
¼ page 131 x 93 mm	— £30
⅙ page 131 x 58 mm	— £20

Column rate: £2 per s.c.c. Min. 3 cm.

CLASSIFIED ADVERTISING

(Pre-paid only)

Display £1.80 per s.c.c. Min. 3 cm.

Semi-display £1.40 per s.c.c. Min. 3 cm.

Word rate: 10p per word. (minimum £3.00).

Box Nos. 50p per insertion.

No circulars or packets can be forwarded.

SAE for ad clip; 85p for voucher copy.

PLEASE SEND REPLIES TO BOX NUMBERS TO THE ADVERTISE-
MENT DEPARTMENT, NOT TO
CORNWALL.

PERSONAL

COUPLE 33-28 small capital. Search couple already installed or with capital wanting to share. Desire self-sufficiency. Interests organic gardening, poultry, beekeeping. Any area England or Scotland. Contact: C. Rowdon, 45 Rue Roche-chouart, 75009, Paris, France.

PROPERTY

NEW WHOLEFOOD RESTAURANT and shop soon to be established in Brussels. Situated in ideal position in city adjacent to Porte Louise, Foreign Office and Law Courts. We are seeking an experienced and highly motivated couple to cook and manage both places. Some investment necessary for installation of food shop only. Fair knowledge of French desirable. Interview in London possible. Write to: Mrs. W. Rose-Neil, 23-27 Orchard Avenue, London N3.

SITUATIONS VACANT

ESTABLISHED ten-acre holding for sale rural Worcestershire. Modern house and shed. Orchard. Soft fruit, vegetables all grown to recognised organic standards. Quarter acre plastic walk-in tunnels with spray irrigation. Box. PD109.

PUBLICATIONS

THE affluent nations are spreading their wasteful feeding habits — and the associated degenerative diseases—through the world. Isn't it time concerned people stopped being dominated by habits and helped to pioneer a truly humane, economical, healthier way of life? "Introduction to Practical Veganism" (with basic recipes) and free leaflets Vegan Society Dept. R, 47 Highlands Road, Leatherhead, Surrey.

Methane by S. Sampson

Over 30 different designs suitable for D-I-Y installations, farms, communities, and horticulture. Biological and biochemical background. £1.60 p & p included.

A Blueprint for Survival — USA

There are surplus stocks of *A Blueprint for Survival* at the following bookstores: University Store, Vermont University, Burlington, Vermont 05401, and Book Dept., Students' Store, Associated Students, 308 Westwood Plaza, Los Angeles, Calif. 90024. Send for your copy (\$1.45) for fast delivery.

CLASSIFIED ADVERTISEMENTS MUST BE PREPAID

To: The Ecologist Advertisement Department,
Uphill, Urchfont, Devizes, Wilts.

Please insert the following advertisement in the next issues.

Cheque/P.O. to *The Ecologist* enclosed.

(Word rate 10p per word. Box No. 50p. Minimum charge £3.00).

Name: (Block letters please)

Address:

Date:

Signed:

POSITION AVAILABLE

Director, School of Architecture
University of Waterloo

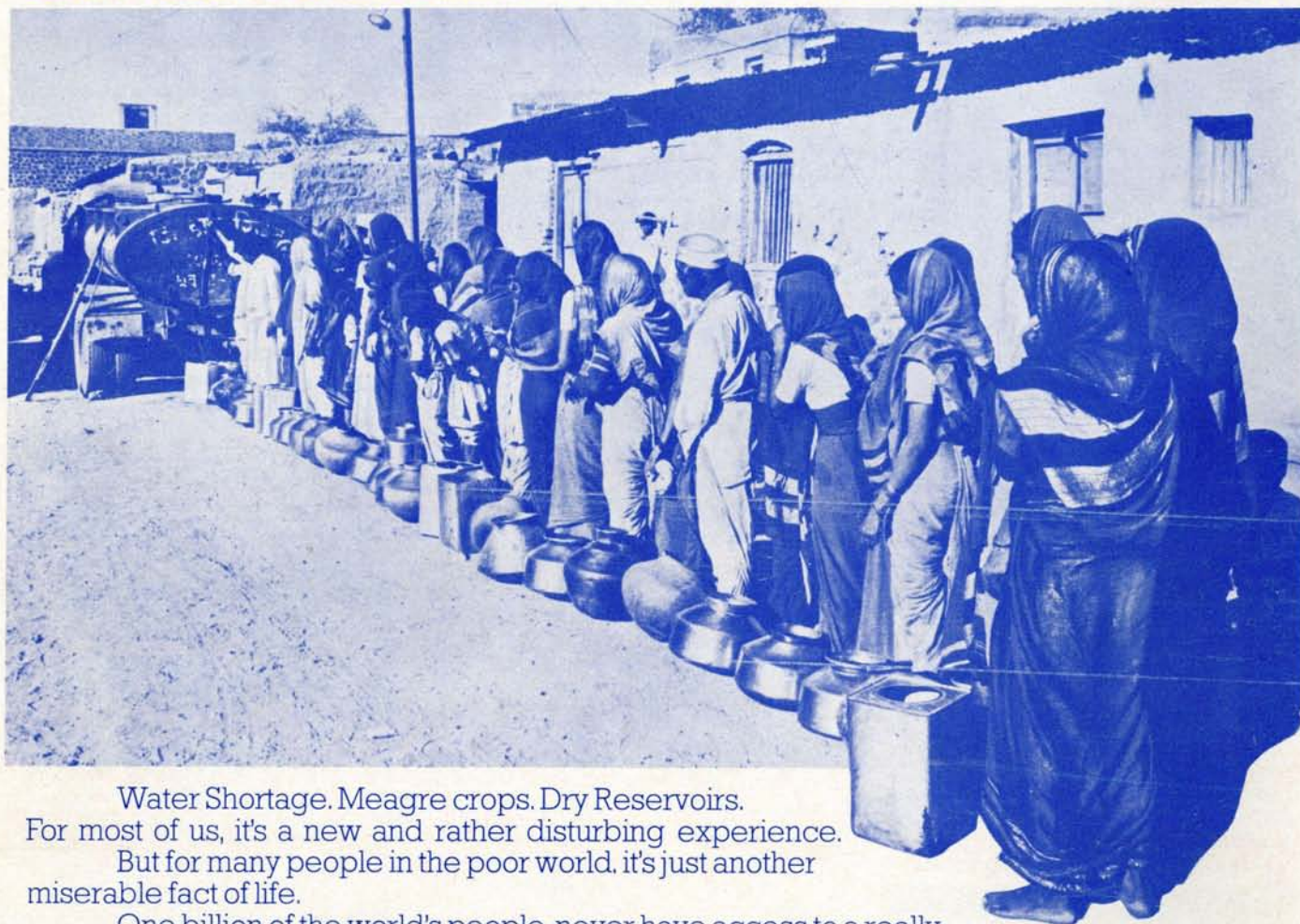
beginning July 1, 1977, normally for a
three year term.

The School offers a three year pre-architecture degree programme and a subsequent two year professional B.Arch. programme to approximately 250 students. The School is in the Faculty of Environmental Studies, with a School of Urban and Regional Planning, a Department of Geography, and a Department of Man-Environment Studies. Applications close on November 15, 1976. For further information or to apply with resume, write to:

Peter C. Brother
Executive Assistant to the Dean
Faculty of Environmental Studies
University of Waterloo
Waterloo, Ontario
N2L 3G1

July 27, 1976.

IN BRITAIN IT'S A CRISIS. IN INDIA IT'S A FACT OF LIFE.



Water Shortage. Meagre crops. Dry Reservoirs.
For most of us, it's a new and rather disturbing experience.

But for many people in the poor world, it's just another miserable fact of life.

One billion of the world's people, never have access to a really safe supply of water. Which means that if the water's there, it's dirty water, with all the danger of disease and ill health that that brings.

And here's another fact of life that we might all remember as we turn off our taps. Half the women of the world don't have taps to turn off. They have to fetch and carry their family's water supply every day. Which often means walking many gruelling miles in the full heat of the sun.

Ever since Oxfam started we have been helping communities round the world to improve their sources of water.

Just recently we've been digging wells in Brazil. We've made dams for irrigation and drinking water in Uttar Pradesh, India. And we've piped water to mountain villages in Lesotho, Southern Africa.

Just so that they can enjoy the basic supplies that we all enjoy. Even during our drought.

While you're saving water this year, won't you please help us bring it to some of the millions who never have enough?

Please send your donation to Malcolm Harper, Room 37, Oxfam, Oxford.

Name/Address

If you would like to know more about what Oxfam is doing to help combat drought, please write to the above address.

E1/10/W

OXFAM