

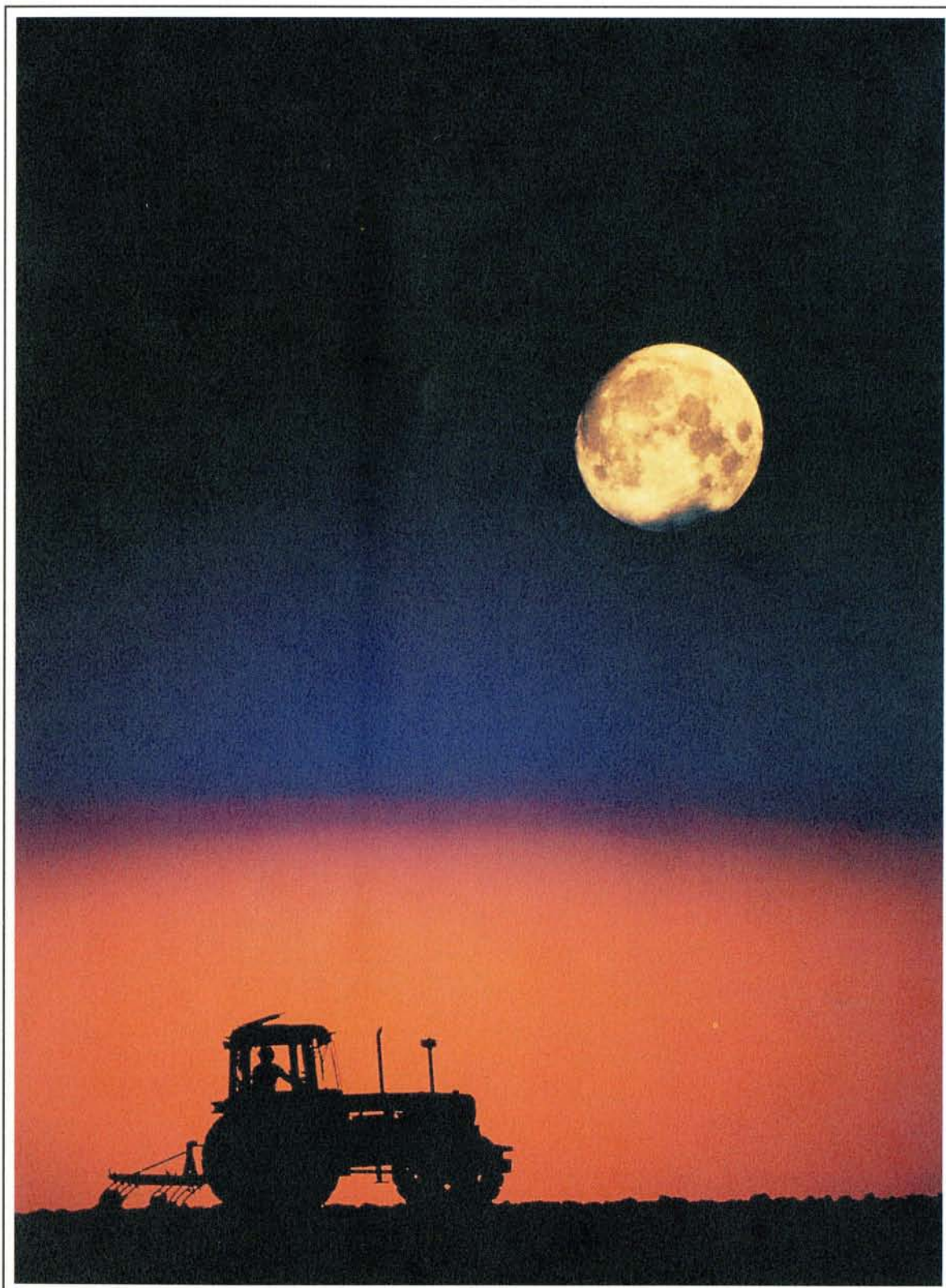
The Ecologist

Vol 22 No 2 March/April 1992

£3 (US \$6)

-
- Economics in a Hotter Time
 - Resisting Sustainable Development
 - Zaire: Deforestation and Landlessness
 - Mad Cows and Organo-Phosphates
-

ISSN 0261-3131



Twilight for the Family Farm:
The Politics of Industrial Agriculture



UNIVERSITY OF YORK

M.A., M.Phil., D.Phil., in SOUTHERN AFRICAN STUDIES

The Centre for Southern African Studies offers an MA course in Southern African Studies available over 12 months full-time and 24 months part-time. The degree is multi-disciplinary, drawing on the resources of economics, history, literature, politics, anthropology and sociology to understand the region.

The Centre also offers supervision for the degrees of M.Phil and D.Phil on southern African topics in the fields of economics, history, literature, politics and sociology.

Application forms and further information from:
**The Secretary, Centre for Southern African Studies,
The University, Heslington, York YO1 5DD.**



SOAS

DEVELOPING PERSPECTIVES

SOAS, the leading centre for the study of Africa, Asia and the Middle East with over 200 academics, offers a wide range of Masters degrees in the Humanities and Social Sciences. These include:

**Development Studies; Anthropology; Politics;
Development Economics; Economics (Asia-Pacific or
Africa or Middle East); Law (LLM); Geography; Area
Studies (African or Afro/American/Caribbean or Far East
or Turkey or Near and Middle East or South Asia or
South East Asia)**

Further information is available from The Registrar (Ref Ecot), School of Oriental and African Studies, University of London, Thornhaugh Street, Russell Square, London WC1 0XG. Tel 071 637 2388, Fax 071 436 4211.

MORE COURSES ON PAGE 80 AND INSIDE BACK COVER

The Ecologist is published by Ecosystems Ltd.

Editorial Office: Agriculture House, Bath Road, Sturminster Newton, Dorset, DT10 1DU, England.
Tel 0258 73476 Fax 0258 73748 E-Mail gn:ecologist. **Editorial Assistant:** Sally Snow.

Subscriptions: RED Computing, 29A High Street, New Malden, Surrey, KT3 4BY, England.
Tel 0403 782644 Fax 081 942 9385.

Books and Back Issues: WEC Books, Worthyvale Manor, Camelford, Cornwall, PL32 9TT, England.
Tel 0840 212711 Fax 0840 212808.

Annual Subscription Rates

£18 (US\$32) for individuals and schools;

£45 (US\$70) for institutions;

£15 (US\$25) concessionary rate
(unwaged people and subscribers in the
Third World and Eastern Europe).

Air mail **£11 (US\$19)** extra.

Concessionary rate only available from RED
Computing and The MIT Press and not through
other subscription agents.

The Ecologist is published bi-monthly. The rates
above are for six issues including postage and
annual index.

Subscriptions outside North America payable to The
Ecologist and sent to RED Computing (address
above). We welcome payment by UK£ cheque
drawn on UK bank, US\$ check drawn on US bank,
eurocheque written in UK£, banker's draft payable
through an English bank, UK or international postal
order, Access, Visa or MasterCard.

North American subscriptions payable by check
drawn on US banks in US funds to: **MIT Press
Journals, 55 Hayward Street, Cambridge, MA
02142, USA. Tel (617) 253-2889.**

Advertising

Display Rates:

Full Colour Outside Back Cover:	£950
Full Page (261x185mm):	£900
Half Page (130x185mm/261x90mm):	£500
Quarter Page (65x185mm/130x90mm):	£275
Third Page (261x58mm/85x185mm/175x121mm):	£325
Sixth Page (130x58mm/65x121mm):	£195
Eighth Page (65x90mm):	£150
Sixteenth Page (32x90mm):	£95

17.5% VAT to be added to above rates.
Typesetting charge 20% of advertising rate.

Inserts

Up to 265x185mm and not more than 10g each:
£45 per thousand plus VAT.

Further information and full rate card from:
**Jake Sales, 6 Cynthia Street, London, N1 9JF.
Tel 071 278 6399, Fax 071 278 4427.**

Classifieds

See inside back cover.

Contributions

The editors welcome contributions, which
should be typed, double spaced, on one
side of the paper only. Two copies should
be sent with original. Word processed con-
tributions should be on a 3.5 inch disk (MS-
DOS or Macintosh) in text file (ASCII) for-
mat. Illustrations (B/W or colour prints or
transparencies, line drawings, tables,
maps etc.) should be included where ap-
propriate. Detailed guidelines for
contributors are available on request.
Manuscripts should be addressed to the
editors and sent to the Editorial Office.

While every care is taken with manuscripts
submitted for publication, the editors can-
not guarantee to return those not accepted.
Articles published in The Ecologist do not
necessarily express the views of the
editors.

The Ecologist International Serial Number
is: ISSN 0261-3131.

Printed by Penwell Ltd., Station Road, Kelly
Bray, Callington, Cornwall, PL17 8ER.
Tel 0579 83777.

Copyright The Ecologist 1992

The Ecologist is available on microfilm from University Microfilms International, 300 North Zeeb St., Ann Arbor, MI, USA.

Editors

EDWARD GOLDSMITH
NICHOLAS HILDYARD
PETER BUNYARD
PATRICK McCULLY

Assistant Editor

SIMON FAIRLIE

Associate Editors

PATRICIA ADAMS
Probe International
(Canada)

MARCUS COLCHESTER
World Rainforest Movement
(England)

RAYMOND DASMANN
University of California,
Santa Cruz (USA)

SAMUEL S. EPSTEIN
University of Illinois
(USA)

ROSS HUME HALL
(USA)

SANDY IRVINE
The Green Party
(England)

MICK KELLY
University of East Anglia
(England)

MARTIN KHOR KOK PENG
Consumers Association of
Penang (Malaysia)

SMITHU KOTHARI
Lokayan Social Action
Group (India)

SIGMUND KVALØY
Ecopolitical Ring of Cooperation
(Norway)

LARRY LOHMANN
(USA)

JOHN MILTON
(USA)

JIMOH OMO-FADAKA
African Environmental
Network (Kenya)

JOHN PAPWORTH
Fourth World Review
(England)

ROBERT PRESCOTT-ALLEN
PADATA
(Canada)

JOHN SEED
Rainforest Information Centre
(Australia)

VANDANA SHIVA
Research Centre for Science
and Ecology (India)

HENRYK SKOLIMOWSKI
University of Michigan
(USA)

ROBERT WALLER
Commonwealth Human Ecology Centre
(England)

RICHARD WILLSON
(England)

DONALD WORSTER
University of Kansas
(USA)

EDITORIAL OFFICE,
AGRICULTURE HOUSE, BATH ROAD,
STURMINSTER NEWTON, DORSET,
DT10 1DU, ENGLAND.
TEL +44-258-73476 FAX +44-258-73748
E-MAIL GN:ECOLOGIST

The Ecologist

Vol. 22, No. 2, March/April 1992

Editorials

Pascal's Wager and Economics in a Hotter Time 42
David W. Orr

The Urgent Need for a Campaign Against Forced Resettlement 43
Peggy Hallward

Feature Articles

Grassroots Resistance to Sustainable Development 45
Gustavo Esteva and Madhu Suri Prakash

Economic projections and abstract promises of social justice mean little to those whose homes and culture are threatened by the Narmada Valley Project. Their struggle for survival may form the basis of a new movement against the ravages of development.

Mad Cows and Warble Flies 52
Mark Purdey

Despite the Ministry of Agriculture, Fisheries and Food's assurances, the BSE epidemic is still not under control; yet MAFF are ignoring evidence that organophosphate insecticides may play a contributory role in the development of the disease.

Deforestation in Zaire 58
John Witte

With the timber resources of West Africa nearly exhausted, logging companies are now moving into the forests of Zaire. They are followed by an underclass of landless settlers, who have been impoverished by Belgian colonialism and the corrupt policies of the Mobutu regime.

The Politics of Industrial Agriculture 65
Tracey Clunies-Ross and Nicholas Hildyard

Agronomists and politicians are belatedly recognizing the environmental and social destructiveness of modern agriculture; but too many of the proposals for change come from vested interests. For an alternative to be viable, it must confront the social and economic forces at the root of the crisis.

Report

Burma's Forests Fall Victim to War 72
Rod Harbinson

Books 74

Letters 78

Courses 80

The Ecologist is printed on recycled paper whitened with hydrogen peroxide.

Pascal's Wager and Economics in a Hotter Time

In weighing the question concerning the existence of God, 17th century philosopher and mathematician, Blaise Pascal, proceeded in a manner perhaps instructive for other, more mundane questions. Pascal decided that if he chose not to believe in God and lived a life in pursuit of "poisonous pleasures, glory and luxury", yet it turned out that God did exist, he would have condemned himself to long term misery. In other words, he would have hell to pay. On the other hand, if God did not exist yet he lived a life of faith — "honest, humble, grateful, generous, a sincere friend, truthful" — he would have sacrificed only a few fleeting pleasures but gained much more. His argument for faith, then, rested on the sturdy foundation of prudential self-interest aimed to minimize risk.

The world now faces a somewhat similar choice. On one side a large number of scientists believe that the planet is warming rapidly. If we continue to spew out heat trapping gases, they say, we will warm the planet intolerably within the next century. The consequences of dereliction and procrastination may include killer heat waves, drought, sea-level rise, fierce storms, vast changes in forests and other ecosystems, considerable economic dislocation and increases in disease. A passable description of hell. But like Pascal's wager, no one can say with absolute certainty what will happen until the consequences of our choice, whatever they may be, are upon us. Nonetheless, as with Pascal, "we must wager. It is not optional."

Others, however, claim to have looked over the brink and have decided that hell may not be so bad after all, or at least that we should research the matter further. Yale University economist, William Nordhaus, for example, believes that a hotter climate will mostly affect "those sectors [of the economy] that interact with unmanaged ecosystems."¹ The rest of the economy, including that which operates in what he calls "a carefully controlled environment", which includes shopping malls and presumably the activities of economists, will hardly notice that things are considerably hotter. "The main factor to recognize," Nordhaus asserts, "is that the climate has little economic impact upon advanced industrial societies."²

Professor Nordhaus concludes that "approximately three per cent of US national output originates in climate-sensitive sectors and another ten per cent in sectors modestly sensitive to climatic change." There may even be, he notes, beneficial side effects of global warming: "The forest products industry may also benefit from CO₂ fertilization." (His use of the phrase "forest products industry" rather than "forests" is, I think, deliberate.) Construction, he anticipates, will be "favorably affected" as will "investments in water skiing". In sum, Professor Nordhaus's "best guess" is that the impact of a doubling of CO₂ "is likely to be around one-fourth of one per cent of national income", an estimate that he confesses has a "large margin of error".

Textbooks in Space

Nordhaus does not wish to be thought to favour climate change. Rather, the point he wants to make is that "those who paint a bleak picture of desert Earth devoid of fruitful economic activity may be exaggerating the injuries and neglecting the benefits of

climate change." Whether a hotter earth might be devoid of poetry, laughter, sidewalk cafes, forests or even economists he does not say. But he does note that there are a number of technological responses to our plight including "climatic engineering . . . shooting particulate matter [books on economics?] into the stratosphere to cool the earth or changing cultivation patterns in agriculture." Professor Nordhaus gives no estimate of the costs, benefits or even feasibility of these "options". He does, however, estimate the cost of reducing CO₂ emissions by 50 per cent as \$180 billion per year. Faced with such costs, Nordhaus thinks that "societies may chose to adapt", which in his words means "population migration, capital relocation, land reclamation, and technological change," solutions for which he again gives no cost estimate. And what about those who cannot adapt, migrate, buy expensive remedies or relocate their capital? Nordhaus does not say.

"The efficient policy" on global warming, Nordhaus argues, "would be to invest heavily in high-return capital now and use the fruits of those investments to slow climate change in the future." He describes this as a "sensible compromise" between the "need for economic growth" and "the *desire* for environmental protection" (emphasis added). One more binge, virtue later.

Unpleasant Surprises

To his credit, Professor Nordhaus does acknowledge that "most climatologists think that the chance of unpleasant surprises rises as the magnitude and pace of climatic change increases." He also notes that the discovery of the ozone hole came as a "complete surprise", suggesting the possibility of more surprises ahead. But in the end he comes down firmly in favour of what he calls "modest steps" that "avoid any precipitous and ill-designed actions that [we] may later regret." Nordhaus believes that "reducing the risks of climatic change is a worthwhile objective," but one in his opinion not more important than "factories and equipment, training and education, health and hospitals, transportation and communications, research and development, housing and environmental protection" and so forth. He seems not to have noticed the close relationship between heat, drought and climate instability on one hand, and the economy, public health, human behaviour under stress, or even what he calls "environmental protection" on the other.

One might dismiss Professor Nordhaus's analysis as an aberration were it not characteristic of the recklessness masquerading as caution that prevails in the highest levels of government and business in the US and elsewhere, and were it not for the influence he commands at these levels. Nordhaus's views on global warming are neither an aberration within his profession nor are they without consequence where vital choices are made.

Nordhaus's opinions weighed heavily in the 1991 report issued by the "Adaptation Panel" of the US National Academy of Sciences. The Panel assumed a great deal about the adaptability of complex, mass, technological societies under what may be extreme conditions. In citing "the proven adaptability of farmers", for example, was it referring to the 4 million failed farms in the US in the past 50 years? Or to those 1.5 million farms presently at or

close to the margin? Or to present rates of soil loss and ground-water depletion due to current farm practices? Can farmers adapt if warming is sudden? Since people live "in both Riyadh and Barrow", the panel drew the implication that humans are almost infinitely adaptable, while admitting that some cities will have to be abandoned, and people in poorer countries may be substantially harmed. The panel did not ask what could happen beyond its 50-year horizon.

The belief that decline in agriculture and forestry would be of little consequence because they are only three per cent of the US economy is equivalent to believing that since the heart is only about two per cent of bodyweight, it can be removed or damaged without consequences for one's health. Both Professor Nordhaus and the Adaptation Panel regard the economy as linear and additive, without straws that break the camel's back. The biological facts underlying the research are also suspect. There are many reasons to believe that "CO₂ fertilization" will not enhance farm and forest productivity as Nordhaus and the Panel believe. Changes in the rainfall, temperature and biological conditions necessary for propagation would more likely reduce growth.

The economic estimates used by Nordhaus and the Adaptation Panel are also questionable. Both ignore a large and growing body of evidence that the actions necessary to minimize global warming would be good for the economy, human health and the land. Furthermore, the estimates do not include the costs of relocating millions of people, or of failing to do so, or the costs of diking coasts, pursuing international conflicts over water, importing food to the US when the plains states become drier, or fighting diseases due to climate change.

The economic estimates of Professor Nordhaus and the Academy Panel are not to be trusted because their economy is an abstraction independent of biophysical realities, comparable, say, to an airline pilot who regarded the law of gravity as merely an interesting but untested theory. Their economics are not to be trusted because they fail to acknowledge the vast and unknowable complexity of planetary systems which cannot be "fixed" by any technology without courting other risks. Their economics are not to be trusted because the problem of global warming is not first and foremost one of economics as they believe, but rather one of judgement, wisdom and love for the creation. Their economics

cannot be trusted because they do not include flesh and blood people who, under conditions of a rapidly changing climate, will not necessarily act with the rationality presumed in abstract models concocted in air conditioned rooms. Real people stressed by heat, drought, economic decline and perhaps worse, will curse and kill more often and celebrate and love less often. And they will mourn the loss of places disfigured by heat, drought and death that were once familiar, restoring and consoling.

Finally, the economics of Professor Nordhaus and the Academy Panel cannot be trusted because they would have us take such risks for the sake of another decade or two of business as usual, which does not mean sustainable prosperity or basic fairness. This is a foolish risk for reasons Pascal described well. If it turns out that global warming would have been severe and we forestalled it by becoming more energy efficient and making a successful transition to renewable energy, we will have avoided disaster. If, however, it turns out that factors as yet unknown minimized the severity and impact of warming while we became more energy efficient in the belief that it might be otherwise, we will not have saved the planet, but we will have reduced acid rain, improved air quality, decreased oil spills, reduced the amount of strip mining and lessened our dependence on limited supplies of fossil fuels. In either case we will have set an instructive and farsighted precedent for our descendants and for the future of the earth. If we gain, we gain all; if we "lose", we still gain a great deal. On the other hand, if we do as Professor Nordhaus and the members of the Adaptation Panel would have us do and the warming proves to be rapid, there will be hell to pay.

David W. Orr

David W. Orr is Professor of Environmental Studies at Oberlin College, Oberlin, Ohio 44074, USA. This is a shortened and edited version of an article to appear in the journal *Ecological Economics* later this year.

References

1. Nordhaus, W.D. 'Global Warming: Slowing the Greenhouse Express', in Aaron, H. (ed.) *Setting National Priorities*, Brookings Institution, Washington, DC, 1990.
2. Nordhaus, W.D. 'Greenhouse Economics: Count Before you Leap', *The Economist*, 7 July, 1990.

The Urgent Need for a Campaign Against Forced Resettlement

In the preparations for the celebrations commemorating the 500th anniversary of Columbus's landing in the Caribbean, over 120,000 people were evicted from their homes in the Dominican Republic. It was an appropriate gesture. From the moment the Spaniards arrived in South America and started removing Indians from their lands, the history of colonialism has been a history of forced resettlement. Clearances (in Scotland), reservations (in the US), collectivization (in Russia) and homelands (in South Africa) are just four of the means that have been employed to relocate citizens who have stood in the way of "progress".

With the transition from colonialism to development, the reasons for resettling unwanted people have, if anything, increased. To make way for open-cast mines, 10,000 Navaho and Hopi native Americans are being removed from the Big Mountain

reservation in Arizona. In Thailand, the Khor Chor Kor project will evict up to 970,000 families from their land, so that fast-growing trees may be planted for timber and wood-pulp. In Bali, Goa and other tourist paradises, homes and villages are being demolished to provide space for hotels. And in a drive to beautify Seoul for the 1988 Olympic Games, 900,000 people were violently removed from their homes.

Such wholesale disruption of human lives, we are told, is all in a good cause. David Hopper, former Senior Vice-President of Policy, Planning and Research at the World Bank puts it bluntly: "You can't have development without somebody getting hurt for the benefits that are going to accrue." But according to anthropologist Thayer Scudder, forced resettlement is "about the worst thing you can do to a people . . . next to killing them."

Involuntary resettlement destroys local economies and productive assets, creating poverty and food insecurity. It tears apart families and breaks up traditional social safety nets, leading to acute psychological, social and cultural stress. And it causes disease. In short involuntary settlement can be the death of people. And not only does it wrench people away from the environment they depend upon; in the words of one World Bank report, it also "causes severe environmental effects and the loss of valuable natural resources."

Horror Stories

That the World Bank has plenty to say about resettlement is hardly surprising, for resettlement is its business. As the largest development agency in the world, it is involved in more such projects than any other institution. In some cases these are linked to transmigration or plantation schemes; but the majority are associated with large scale hydroelectric and irrigation projects. Often replacement land for displaced people is not provided — or even available in densely populated countries like India — so "evacuees" end up as landless labourers, or unemployed in city slums.

Resettlement horror stories abound. The Balbina dam on Brazil's Uatuma River, completed in 1986 with the help of a \$550 million World Bank loan, flooded 2,400 square kilometres of rainforest and forced one-third of the Waimiri Atroari Indians off their land. More than half their population has died as a result of social and economic disruption, environmental degradation and horrific health conditions. In Indonesia, 25,000 peasants were flooded off their land by the World Bank-funded Kedung Ombo dam. Hundreds of families protested against the resettlement plan by remaining in the reservoir, even as the waters poured in. Eight people drowned in the ensuing chaos. Today, over a year later, several hundred people still live in the dam area, holding out for an acceptable rehabilitation package.

The Bank, which is currently financing projects that are forcibly resettling an estimated 1.5 million people, is unchastened by these cases. Projects in its pipeline may force another 1.5 million to move.

In Thailand, for example, the Pak Mun dam will displace up to 20,000 peasants and threaten the fisheries of the Mekong. The resettlement record of the Thai electricity utility EGAT — which is responsible for building the dam and compensating those displaced by it — is abysmal. In 1967, EGAT resettled villagers displaced by the Sirindhorn dam on barren, rocky land, totally unfit for farming. Many of the farmers had to abandon the land to seek work in the crowded cities. Now EGAT proposes that villagers flooded off their fertile farmland by the Pak Mun dam move to marginal land beside that given to the Sirindhorn evacuees.

In India, 300 kilometres west of Calcutta, the World Bank is proposing to continue its funding for the Subarnarekha Multipurpose Project, one of whose dams, the Icha, will displace nearly 30,000 people. On 5 April 1991, 450 local people — mostly tribal women and children — began a peaceful protest against the Icha dam. Three days later, they were arrested, and were kept in jail for over a month.

And in China, the World Bank is preparing seven projects involving resettlement. That which looms largest on the horizon is the \$12 billion Three Gorges dam on the Yangtze River, which will force about one million people to move. The dam's 600 kilometre-long reservoir will drown dozens of archaeological sites, parts of ten cities, more than 800 villages and up to 44,000 hectares of precious farmland. The World Bank, Canada, the US and Japan will almost certainly be approached for funding. Since the late 1950s, more than ten million Chinese have been relocated because of water management projects. According to

China's Ministry of Water Resources, more than a third of these people are still impoverished.

The World Bank is aware of the horrible consequences of forced relocation. Its own report, *Involuntary Resettlement in Development Projects*, goes into gruesome detail about the "extraordinarily disruptive and painful process" which the victims of forced resettlement must endure. The Bank, however, still believes that it is acceptable to force people to move because it has written a policy whose goal "is to ensure that the population displaced by a project receives benefits from it."

With this policy the Bank only endorses and entrenches the notion of involuntary resettlement. The Bank staff are led to believe that there is nothing wrong with continuing to plan projects which call for forced resettlement. The principle behind this policy is that the power to make decisions about development should reside with the planners and not with the local people. If instead local people could reject, accept or modify proposed plans, then involuntary resettlement — along with much social injustice and environmental damage — would be drastically reduced. However, the World Bank and other aid agencies show no signs of change. They reject outright the idea that planners should be required to negotiate with affected communities until the latter are satisfied; for this might mean the complete abandonment of the project.

Fighting Back

Villagers and tribals are now insisting that their voice is heard and in many cases are mobilizing to defend their homes. The campaign to stop the Narmada dams is perhaps the best known example, but there are many others. Brazil's Kayapo Indians successfully fought a series of dams on the Xingu River. And in Mexico, the Nahuas Indians are opposing construction of the San Juan Tetelcingo dam, which would flood the traditional lands of 30,000 people. "To take us away from here they will have to kill us," a Nahua spokesman has said.

The international environmental community has begun to lend support to these struggles. In their critique of the World Bank's draft Forest Policy, 20 NGOs pointed out "the completely unacceptable loophole" which allows involuntary resettlement of forest dwellers. And in their 1991 open letter to the International Commission on Large Dams (ICOLD), the International Rivers Network said that ICOLD should "adopt guidelines protecting human rights and indigenous cultures from forced resettlement."

But not enough has been done to draw attention to this issue. Governments in the North and South alike, plus the international aid agencies, still think involuntary resettlement is acceptable, albeit regrettable. NGOs could make a difference by launching a worldwide campaign against involuntary resettlement. The campaign could be organized centrally or, better still, in a decentralized manner by region, or even by country. Alternatively, NGOs could simply incorporate the theme into their everyday work. Targets of the campaign against involuntary resettlement would include the World Bank, regional development banks, bilateral aid agencies and governments — both those which promote forced resettlement and those which fund it.

The campaign should attract groups and individuals concerned with environmental issues, development issues, indigenous peoples and human rights, since resettlement affects all these areas. Involuntary resettlement is so offensive that it should be opposed by all concerned with social and ecological justice.

Peggy Hallward

Peggy Hallward is Director of Forestry Research for Canadian environmental group Probe International, 225 Brunswick Avenue, Toronto, Ontario M5S 2M6.



Roderick Johnson/Images of India

Labourers on the Narmada Sagar Project carry rocks for eight rupees (20 pence) per ten hour day. The Narmada Sagar dam in Madhya Pradesh is the second major dam planned for the Narmada river.

Grassroots Resistance to Sustainable Development: Lessons from the Banks of the Narmada

by

Gustavo Esteva and Madhu Suri Prakash

Both those resisting and those defending the Narmada Valley Project use the language of social justice and sustainable development, and both lobbies have justified their stance with cost-benefit analyses and grassroots mobilization. The most effective opposition to the dams, however, has come from groups whose concern is not abstract rights and promises, but the survival of local cultures and the autonomy of communities. If grassroots groups can retain their localized, concrete concerns, while making alliances with other groups defending their own localities from destruction, these movements may gain the strength to resist the cultural damage of sustainable development.

In the 1950s, the people of India adopted voting and damming in the same package. Those were years of hope and promise. Old

Gustavo Esteva is a deprofessionalized intellectual working at the grassroots in Mexico. He has written extensively on the myths of development, sustainable and otherwise. He can be contacted at Cordobanes 24, San Jose Insurgentes, Mexico DF 03900. **Madhu Suri Prakash** is an associate professor of education working on the "greening of pedagogy" at The Pennsylvania State University, University Park, PA 16802, USA.

miseries were to be left behind by a democratic society, with electricity and sanitation, food and dignity for everyone. The British Parliament, selected economic elements of the Soviet state system, and Gandhian non-violence: all three models were to be adopted in the newly-independent India, fusing the best of Western capitalism and socialism, along with the best of India's own indigenous traditions.

People came to the ballot box, convinced that this imported

tool for expressing the collective will was both appropriate and legitimate for pursuing the goals conceived for them after the end of British domination. All the dreams suppressed during the many years of foreign oppression were dreamed again. Development, the simple idea of becoming like the developed ones, of having what the developed had, appeared both attractive and feasible. All political parties and leaders seeking respectability committed themselves to it.

The four development decades, from the 1950s to the 1990s, are also the years of the story we want to tell here: the ongoing saga of a people's reactions to the project to develop the Narmada river in western India. We want to ask ourselves if the Narmada struggle could evolve into a search for alternatives to the development ideology, or, whether, as in so many other cases, the anti-dam movement will fall prey to illusions of a new era of development. We want to consider here the kinds of responses that could transform the Narmada story — opening up new lines of thinking on the crises of development being experienced everywhere by people at the grassroots. We want to

ask ourselves whether the Narmada struggle could illustrate, in the years to come, the creative changes in political emphasis, orientation and style that are presently defining many contemporary social movements:

- The more representative democracy is accepted and recognized as the legitimate form of government, the more people abandon ballot boxes, except firmly to say "no", or to create ambiguous, weak, or blurred coalitions without clear mandates, thus changing the very nature and role of power structures;
- The more conventional politics become abstract and transnationalized in order to strengthen the State in the name of social justice, the more people at the grassroots resist and desert such political directions, participating instead in the weakening or dismantling of old structures and bureaucracies, while concretizing and localizing their regional initiatives, rooting them again in their natural and cultural soil;

The Narmada Dams and their Resistors

The Narmada is India's largest westward-flowing river and is of immense religious and cultural importance to the people living on its banks. It is also the subject of the largest river development project in the world, the Narmada Valley Project, which envisages the construction of 33 large dams, 136 medium dams and nearly 3000 small dams.

The largest of the proposed dams, the Sardar Sarovar, is the centrepiece of a power, irrigation and drainage project which is supported by a \$450 million loan from the World Bank, with more money in the pipeline. The total financial cost of the Sardar Sarovar project will be over \$6 billion, according to the most recent World Bank estimates. The dam is now more than 15 per cent complete. If finished to plan, it will submerge thousands of hectares of forests and fertile farmland and drive over 100,000 rural poor and tribal people from their homes.

Despite reassurances from the World Bank and the state governments involved, there is not the remotest prospect that the displaced people, the "oustees", will be resettled in line with the World Bank policy which states that they must at least achieve their previous living standards. Moreover, the disastrous experience of other large dam projects in India shows that it is unlikely that the dam will yield its promised benefits of hydropower, irrigation and drinking water.

In an unprecedented move, the World Bank has set up an independent review team to assess the social, environmental and economic impacts of the project. The mission is due to report back to the President of the Bank at the end of March, 1992.

Since 1988, thousands of people have pledged to die rather than let their lands be flooded by the Sardar Sarovar reservoir. Only the weakness of the 1991 monsoon prevented at least 14 villages from being inundated by water rising behind the partly-built dam. Most of the villagers had not been informed of the possible submergence of their lands and homes, and none had willingly agreed to compensation plans.

The opposition to the Narmada project has been led by the Narmada Bachao Andolan, an alliance of oustees and of environmental and human rights activists and scientists from all over India. The NBA has succeeded in generating a debate across the sub-continent on the desirability of large-scale development projects of all types.

The NBA, and its two charismatic leaders, Medha Patkar and Baba Amte were awarded the 1991 Right Livelihood Award, the "alternative Nobel Prize", for their "steadfast opposition to the ecologically and socially disastrous Narmada dams and their clear articulation of an alternative water and energy strategy that would benefit both the rural poor and the natural environment."

Medha Patkar, a graduate in Social Sciences from the Tata Institute, came to live among the tribals of the Narmada valley in the mid-1980s, and alerted them to the fate which awaited them from the dams. In January 1991, she went on hunger strike for 21 days during a confrontation on the Gujarat-Madhya Pradesh border between an NBA protest march and a group of dam supporters who were bussed in and paid by the Gujarat government. Later last year, Medha Patkar ignored official harassment and threats of arrest and stayed in the areas which risked being flooded during the monsoon. When she was finally arrested in November, a public outcry throughout India led to her being released within two days. All of the numerous charges laid against her — which could have resulted in her spending decades in prison — were unconditionally dropped.

Baba Amte is one of India's most respected social and moral leaders. Most of his life has been devoted to the rehabilitation of leprosy patients. In 1990 he left his community of 2000 patients at Anandwan with the words:

"I am leaving to live along the Narmada . . . Narmada will linger on the lips of the nation as a symbol of all struggles against social injustice."

The Narmada Bachao Andolan can be contacted at, 58, Gandhi Marg, Badwani Dist. Khargone, MP 451 551, India.

- The more human rights are consecrated, legitimized and finally transmogrified into bureaucratic handouts which provision and control communities, the more grassroots groups press for respect of their local spaces, as well as for freedom from the bureaucratic enforcement of these abstract, universal human rights.

The Two Sides of the Narmada Story

By the end of 1986, 1500 large dams had been constructed in India, the most dammed country on earth.

The calamities of drought and the blessings of water reservoirs are both indelibly printed in the Indian experience. It was thus only natural to see dams as a magnificent and feasible extension of previous endeavours, a modern venture ending forever the damnation of thirst and hunger. In fact, dams became the very emblem of development, representing all its promises and panaceas.

From the beginning, the Narmada project was an expression of this fascination for development and it came to be seen as one of the best answers to India's underdevelopment. For its promoters in the central and state governments, and in the World Bank, "the most ambitiously conceived river project in human history", with its 3,200 dams, was the key both to ending hunger and thirst in some of the most drought-ridden provinces in India, and to fostering their economic growth.

The early resisters of big dams had no place in the political fabric created by the illusions of development. They were seen as either selfish, or misguided or irredeemable traditionalists. But, well in advance, these resisters identified the threats posed by the dams to the majority of the "have-nots" in whose name the dams were being built, to the culture of those ousted from their traditional homes, to local environments, and to the environment of the whole country.

Today, as the case of the Narmada illustrates, the critics of these dams include not only those directly displaced, but academics and journalists, as well as regional and national human rights and environmental groups. The Narmada Bachao Andolan (Save Narmada Movement) is a coalition of such individuals and groups, which plays a leading role in researching, lobbying, campaigning and mobilizing people to stop what has been termed "the world's biggest planned environmental disaster".

The Narmada story follows the basic plot of the struggles over rivers and forests which are so familiar in the development era. In contrast to the usual tragic ending of these struggles, however, the Narmada story is still open and offers a fascinating illustration of changes in grassroots movements, as people continue to differentiate between the illusory goals of development and their own genuine interests. The struggle surrounding the Narmada reminds us of how people's imaginations were captured by developers' promises; how they suffered the destruction of their cultures and environments as a result of chasing the illusions of developers; how their resistance was coopted or diverted by developers; and how people at the grassroots are now continuing their search for new directions — where developers and development can no longer pursue them.

To Dam or to *Bachao* the Narmada?

During the 1950s and the 1960s, the Narmada Project was the



Narmada Bachao Andolan leader, Medha Patkar, speaking to dam protesters after a three week fast to protest against the Sardar Sarovar project and police violence against the dam protestors. Patkar ended her hunger strike after persistent appeals from NBA members.

Ali Kazimi

object of fiery competition among neighbouring states. The few dissenting voices opposed to the Narmada project were not heard in the forum of mainstream politics.

By contrast, in the last years of the 1980s and the opening years of the 1990s, the Narmada Bachao Andolan has offered a vocal and sustained struggle from the grassroots against the State's agenda of development in general, and of damming in particular. In its attempts to bring together different groups in order to build on the successes of other grassroots campaigns, the Narmada Bachao Andolan seems to be transforming people's movements. Its membership includes a vast number of different grassroots groups. Although the largest proportion are from Madhya Pradesh and Maharashtra, where the people have most to lose from the Narmada dams, the other states of India do not go unrepresented. The Andolan is gathering increasing international support. Internally, the movement is bringing to the political forefront a number of young and increasingly prominent grassroots activists. Many of these leaders seek to bring together and join forces with dislocated, dispersed communities of "oustees": those compelled to pay the "price of progress", while the growing middle and upper classes of India reap the comforts of development.

Economists against Environmentalists?

The earth's ecological decline and the parallel economic growth of nations are rooted in the clash of two cultures, according to Lester Brown, Director of the Worldwatch Institute. This is not C.P. Snow's classical clash between the academic cultures of scientists and humanists. The contemporary dispute, Brown maintains, lies between the competing and incompatible cultures of economists and environmentalists. Worried by the environmental trends that are threatening to undermine our economy, Brown seeks to bridge this ecologically and economically destructive divide, recommending to both economists and environmentalists the rules of economic progress governed by the laws of environmental sustainability, in other words, sustainable development.

In the light of Brown's analysis, the current clash over the Narmada Project poses a genuine puzzle. Instead of economists and environmentalists being ranged on opposite sides of the debate, this clash reveals economists and environmentalists struggling side-by-side in each of the opposing lobbies. Both those defending and those resisting the project, moreover, applaud Brown's ideal of sustainable progress or development.

For the pro-dam lobby, sustainable development means large scale, ambitious, centralized schemes, capable of meeting the rapidly increasing needs for food, water and energy of an economy that must grow if India is to become developed. Such schemes can only be initiated, financed and managed by the State, conceived as the guardian of the interests of the people.

For the dam's critics, far from being the guardian of its

oppressed, underprivileged citizens, the Indian State remains instead the guarantor and puppet of national and transnational capital. Large projects benefit principally those who already enjoy more than their fair share of privileges, while further annihilating those currently underprivileged. For the critics, the Narmada Project's scale and centralization mean less control by the "have-nots", and more corruption by the "haves".

By attempting to analyze how the sustainable economic progress or development idealized by Brown and growing numbers of others is best achieved, the Narmada project's critics have moved into the arena of the pro-dam lobby. Thus engaged, they argue that the Narmada project's supporters hide its social and environmental costs, while inflating its economic benefits. For them, official cost-benefit analyses underestimate both the inflation-driven rise in costs, and the "real" external or social costs of environmental destruction and community dislocation. In support of their case they can cite the Japanese government, which concluded that "even under heroic assumptions" the largest dam being built on the Narmada, the Sardar Sarovar, is environmentally destructive and uneconomic. This conclusion has led the Japanese to cancel the financial assistance they had committed to the project.

However, the dams' supporters continue to retain their power to control public opinion. For the public of non-experts, the official calculations of sustainable development still hold a respectability which the grassroots groups' exposés have for all practical purposes left unscathed. To maintain support for their claims of sustainable development, the Narmada project's official supporters have moved into their opposition's territory in two areas. In the economic arena, they have designed new cost-benefit analyses that claim to meet the opposition's concerns for social, economic and other hidden costs. In the political arena, they have encouraged "popular participation" as a way of legitimizing their schemes. The official strategy of popular participation involves bringing many of the losers to fight on the winning side, by mobilizing people in the way that grassroots groups have traditionally done. This strategy is illustrated by the march organized by Urmila Patel, the wife of the Chairman of the dam contractors, Sardar Sarovar Narmada Nigam Ltd., who led a pro-dam demonstration of over 20,000 poor peasants and villagers who had been convinced by the authorities that the project would be their lifeline out of drought and starvation.

The confusion that such changes in the nature of the confrontation cause for most people is exacerbated by the fact that both lobbies seem equally sincere in their commitment to the same goals. Both speak the same economic language of sustainable development and the same moral language of social justice and equality. Both employ the same strategies of marches and sit-down protests for demonstrating their solidarity with the underprivileged. Most people cannot follow and understand the technical arguments which apparently divide the experts. Most cannot discern that this technical discourse may mask a genuine clash of cultures.

The Western "Temples" of Modern India

The Bhakra Nangal, India's first major dam, was called the "temple of modern India" by the first Prime Minister of the country after independence. Nehru prayed at this as well as the other modern "temples" designed to help transform India into a developed nation.

Themes for 1992

- Biodiversity, pesticides and organic pest control
Sustainability for poor food producers.
- Acceptable standardization for the South.
- Communicating for technology transfer.
- Do-it-herself – women's innovation in technology.



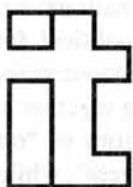
APPROPRIATE TECHNOLOGY

The quarterly magazine of practical change in the developing world

Reports from the field for anyone concerned with development in practice. Plus the latest in appropriate technology applications, news from Intermediate Technology, book reviews, Foodlines, Resources Guide and a development diary.

Annual subscriptions
£18/\$35 institutions £14/\$27 individuals

Intermediate Technology Publications
103 -105 Southampton Row,
London WC1B 4HH, UK



Such prayer would have been repugnant to Gandhi. Gandhi's *Hind Swaraj* advocated indigenous goals and means for social change, and was rooted in the traditions and technologies of the people. The processes of cultural conversion through the "temples" that symbolized Western progress were revealed by Gandhi to be the virtual continuation of "English rule without the Englishman". He resisted the technologies and institutions of the English, precisely because they had demonstrated their intrinsic oppressiveness. Well in advance of others, Gandhi rejected Western progress, culture and society as a path for independent India, believing that its large scale, centralized, opaque institutions and technology would inevitably lead to human degradation.

Nehru, however, led other Indians into misconstruing *Hind Swaraj* as the neurotic bigotry of a jingoistic crank, an impractical *Mahatma*, superb at the role of the new nation's *bapu*, but incapable of playing the practical role of the professional planner and economist India needed

to catch up in the development race. Gandhi's vision was successfully swept aside as Nehru urged his countrymen to march to the tune of development.

Rejecting Nehru's Legacy

The growing grassroots resistance to the Narmada project and other dams reveals that some Indians are now struggling harder than ever to reject Nehru's legacy. These people recognize that despite its military prowess and expanded middle-class, India is not, as Nehru promised, catching up with the West; and that what Western progress it has achieved is, as Gandhi warned, at a high social, cultural and ecological cost.

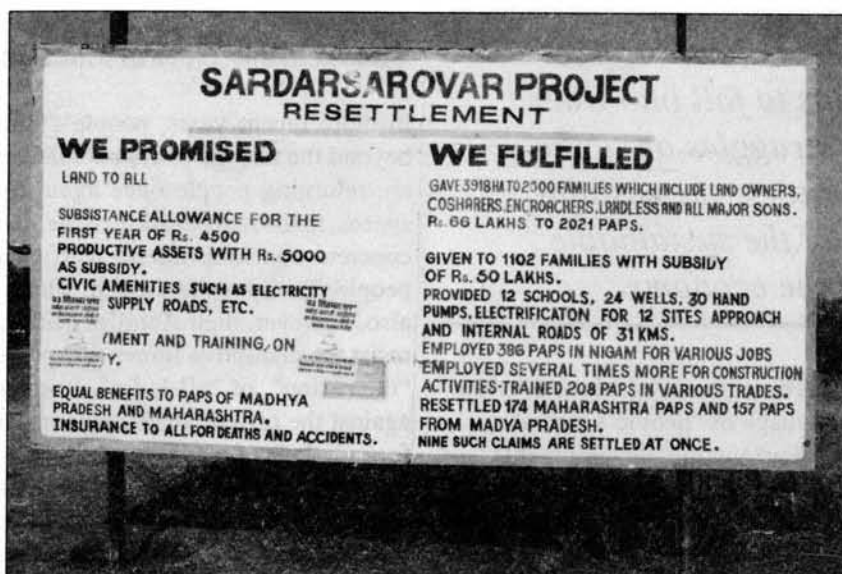
Four decades ago, even the most devoted disciples of Gandhi were unwilling to follow him on the path away from the "progress" that Western development promised. The leaders and citizens of the newly-free India lacked the faith and imagination to conceive goals different from those pursued by the colonizers. But the picture has changed. Grassroots activists are now skilled at arguing for people's sciences and technologies which are humbler, on a smaller scale, socially and environmentally sustainable and extensively tested in modern conditions. The successful campaigns that stopped the construction of some of Nehru's temples of progress (such as the dams planned for Silent Valley in Kerala and Bedthi in Karnataka) suggest that Gandhi's truths about development and modernity might finally, almost a century later, be finding an audience among his people.

Going beyond the rhetoric of sustainable development, peo-

ple at the grassroots are recognizing the rich traditions that face destruction through large dams. Their protests push the debate towards the imperative to respect threatened cultures, because of their own intrinsic worth as well as for the ideal and practice of sustainability revealed by them. People at the grassroots are struggling to shift the centre of the debate away from the economy, and towards cultural survival and the autonomy of communities. They are learning firmly to reject arguments

based on economic and technical feasibilities, arguments in which States and financial institutions have up to now successfully maintained their dominance.

Today, the challenge for grassroots groups involves, on the one hand, avoiding the devastating forms of communal violence now endemic everywhere. On the other hand, it involves opening up to people the kinds of concrete possibilities and hopes that could help to make the democratic ballot box more meaningful. This involves, among other things, learning to see the ballot



Both sides in the Narmada debate have backed up their cases by comparing the financial benefits which will supposedly accrue through irrigation and electrification, with the costs of construction and compensation for those displaced.

box as a mere *umbrella* for real, direct democracy, rooted in indigenous traditions, radically distinct from the abstraction called "the nation state".

Paths Beyond Sustainable Development

The almost universal consecration of representative democracy as the political regime to be adopted by every nation on earth, has coincided with progressive cynicism towards the ballot box. Fewer and fewer citizens are participating in the electoral processes in more and more cases.

This tendency does not seem to express a preference for more authoritarian regimes, simple apathy or lack of civil consciousness. Rather, it is an expression of the growing conviction that the required changes will not be produced within existing political structures: by electing this or that politician or political party. Of course, every time the arrogance of governments, their authoritarian propensities or their ineptitude become too evident, people do surge to the ballot box to demonstrate their disapproval. Yet, they continue to hold back from directing governments towards constructive projects that reflect the genuine interests of the people.

Political events in India during the last 20 years bear out both of these aspects of the ballot box phenomenon. Both Indira and Rajiv Gandhi were expelled from government after their excesses. To eject them from office, people did use the ballot box. But no clear mandate was presented to their successors, suggesting less of a popular consensus on what people wanted than on what they did not.

This is understandable. No genuine consensus is possible when abstract national plans or dreams replace people's real hopes which are concrete, localized expressions of their cultures. With independence, Indians were given a full collection of national dreams. Their concrete and local hopes, rooted in a specific place and a well-defined tradition, were transformed into expectations of an abstract nature: jobs and comfort for everyone, education and health, equality and social justice, a

Cooptation is the natural trap for grassroots groups to fall into when they shift their struggles on to the oppressor's territory: the sustainable progress of the sustainable growth of the economy.

new role for India in the world. These illusory goals of development were proffered in the language of "people's rights".

Today's latest dream — "sustainable development" — continues to be woven in the abstract terms of the declaration of human rights. The majority of grassroots groups today continue to perceive their social struggles as efforts for the enforcement of such rights; even though in reality the struggle for these rights is inevitably institutionalized by rampant bureaucracies.

Sacrifices at the Altar of Universal Rights

It has taken time for people at the bottom of India's social hierarchy to start perceiving that their real, concrete worlds will continue to be sacrificed at the altar of those abstract universal rights, those national goals monitored by increasingly faceless bureaucracies, distant from the people they are supposed to protect and defend. Conventional social struggles sought mainly to get a different distribution of the development pie. Their failures paved the way for the new social movements in the 1980s, which creatively changed both the orientation and the tactics of grassroots struggle. "Popular participation" was, to start with, genuinely popular action: successful in giving access to those hitherto excluded from the decisions governing their lives. The very success of "popular participation", however, allowed it to be coopted by the State, and to become a tool for the further manipulation and domination of the "have-nots" in the development enterprise. Embedded in a common claim for goods and services called universal human rights, "popular participation" was genetically endowed with the virus for its institutional cooptation.

Grassroots initiatives can only resist the virus that destroyed "popular participation" by continuing to root themselves in highly diversified contexts. What we have now is a wide, open-ended, collection of initiatives, which cannot be reduced to one single definition or classification; they do not address the same issues, claims, class enemies, rights or evils. Instead, they express different cultures, approaches, purposes, values, goals, hopes, perceptions and political attitudes. Cooptation is the natural trap for grassroots groups to fall into when they shift their struggles on to the oppressor's territory: the sustainable progress of the sustainable growth of the economy. In this

territory, the economic mind dominates, speaking the abstract language of "human rights" and "sustainable development". The focus gets locked into issues like the appropriate height of the dams, the desirable size of their submergence zones and the size of the financial allocations for oustees. Centering debate around these issues successfully puts people off the scent of the crime, while serving to increase the legitimacy of the State's development projects.

The Achilles Heel of Localization

In more recent years, people's initiatives have started to go beyond the mirage of abstract national goals. These initiatives are returning people once again to their roots, to their local spaces, to the regeneration of their concrete hopes, expressed in concrete contexts, intended to change the real lives of real people. Their localization, in which lies their basic strength, is also, however, their Achilles heel. Localized only, they cannot resist the disruptive forces that pretend to speak in the name of "the nation", of "all India". Localized only, they seldom win against the official development lobbies which, using abstract formulations of reality to serve their own concrete but uprooted interests, de-localize everything and everyone, and use the consequent volatility to establish new forms of domination.

In facing such Goliaths, grassroots groups need to juggle and sustain a two-fold approach: *first*, they need to formulate their struggles in ways that articulate and unify a range of local, differential conflicts with developers; *second*, they need to conceive and implement highly decentralized forms of political organization which can coalesce with others when and wherever needed while maintaining their roots in their own territory, in all its concreteness — resisting, not only the dams, but also the language of abstract rights used to promote them. Essential to the success of grassroots groups today is a sizeable number of localized initiatives articulating their claims as a common "national" front: of strong and appropriate coalitions squarely facing the "abstract" uprooted forces speaking in the name of "the nation".

For many years, the illuminating awareness of class conscience led to attempts to create class organizations, at the

Closing the door to sustainable development enables grassroots groups to open up a multiplicity of paths for escaping the impasse they find themselves in on the banks of the Narmada.

national and even the international level. In no country was class ever fully organized. What emerged, instead, was a collection of bureaucratized and ideologized people's organizations, fully exposed to corruption and cooptation. After recognizing that it is people, not classes, who struggle, the movements of the 1970s tried to go beyond these limitations, only to fall ultimately into the illusion of "political scale": the bigger the better, as if their strength was directly correlated to the size of their membership.

A new ethos burgeoned in the 1980s. Diverse movements began creating ephemeral or single-issue coalitions which were

better able to avoid the bureaucratization and corruption which so often afflict massive organizations. These flexible coalitions have the capacity to respect the autonomy of every organization, their deep pluralism and differentiation. They have, at the same time, the qualities needed to make an effective impact on the "power" centres, for changing both policies and politics.

If these coalitions limit themselves to speaking only about the project they are opposed to, it is difficult to imagine that grassroots initiatives like the Narmada opposition will get the broad support they badly need to halt the development projects they oppose. On the other hand, if they continue to join their voices together with all the others that are rightfully demanding respect for the soil, the place, the fusion of culture and territory, the freedom to flourish and endure in their local spaces, then grassroots groups may be able to garner enough strength to resist the cultural damage wrought by sustainable development.

Closing the door to sustainable development enables grassroots groups to open up a multiplicity of paths for escaping the impasse they find themselves in on the banks of the Narmada and elsewhere. Closing this door, however, does not come easily where growing numbers are addicted to the abstract dreams of nation states and human rights, of economic growth and high standards of living.

But the limping vessel of development cannot be patched up forever. It is safer to strike out for new horizons in smaller craft. The routes that lie beyond are unlit by the sweeping beam of conventional wisdom. No charts exist, but we do not need them. It is sufficient to point to the multiplicity of cultural shores that can be reached once the leaking ship of development is finally abandoned.

Bibliographical Clues

Human Development, the most recent slogan and report of the United Nations family to revive the myth of development, instead could be its swan-song. UNDP, the development arm of the United Nations, created in the 1950s on the initiative of the US, has recently produced a *Human Development Report*, edited by Mahbub ul Haq (Oxford University Press, New York, 1990). This report offers yet another method for measuring development, thus better identifying the tasks ahead for development agencies. It complements the annual reports on *World Development*, accurately describing the complete failure of development efforts to date, while at the same time initiating heroic, undignified attempts to resuscitate development, and give it a new lease on life.

The Society for International Development, the largest NGO in the world, was created 30 years ago by the "development community" to promote reflection and debate on the concepts, strategies and critiques of development. Its quarterly, *Development: Seeds of Change* (formerly known as *Development: International Development Review*), illustrates very well important changes in development

thinking. In 1980, it published Ivan Illich's discourse at the SID Conference of that year: 'The New Frontier of Arrogance: Colonization of the Informal Sector', *Development: International Development Review*, Vol. 22, Nos. 2-3. This complements Illich's earlier work, 'Planned Poverty: The End of Technical Assistance', in *Celebration of Awareness* (Calder and Boyers, London, 1971), a seminal critique of development. Some of the other important early critiques of development include Claude Alvares, 'Deadly Development', *Development*, Vol. 11, No. 7, October 1983; Gustavo Esteva, 'Development: Metaphor, Myth, Threat', and 'Beware Participation', *Development: Seeds of Change*, No. 3, 1985; and Ivan Illich, 'Peace and Development — the Conflict', *Illustrated Weekly of India*, 5 August, 1984.

After those pioneering essays, a whole line of writing has emerged and flourished, in search of alternatives to development. This work goes beyond the conventional critiques, including the Worldwatch Institute's annual *State of the World* (W.W. Norton, New York and Earthscan, London), which merely look for alternatives within development. *The Development Dictionary: A Guide to Knowledge as Power*, edited by Wolfgang Sachs (Zed Books, London, 1992) contains 20 essays by different authors critiquing and giving alternatives to all facets of development (an edited version of one of the essays in the book, 'Environment and Development: The Story of a Dangerous Liaison', by Wolfgang Sachs, appeared in *The Ecologist*, Vol. 21, No. 6, 1991). Also see Wolfgang Sachs, 'The Archaeology of the Development Idea', *Interculture*, Vol. 23, No. 4, 1990. In India, the works of Claude Alvares ('Development: Much Ado About Nothing', *The Illustrated Weekly of India*, 3 June, 1984; and *Another Revolution Fails* (ed.), Ajanta Books International, Delhi, 1985) and Ashis Nandy (*The Intimate Enemy*, Oxford University Press, New Delhi, 1983; and *Science, Hegemony and Violence: A Requiem for Modernity*, Oxford University Press, Delhi, 1988), are among those which offer important insights on the violence of development, and the imperative to go beyond it. Both Alvares and Nandy ('Culture, State, and the Rediscovery of Indian Politics', *Interculture*, Vol. 21, No. 2, Issue 99) as well as Rajni Kothari ('Masses, Classes and the State', *Alternatives*, Vol. 11, 1986; 'Another India' in *Daedalus*, Vol. 118, No. 4, 1989; and *State Against Democracy*, Ajanta Publications, Delhi, 1988) have dealt extensively with the question of the national state and the critique of conventional politics, bringing attention to the growing importance of grassroots struggles in the battles surrounding development. On this, see also, Saul Mendlovitz and R.B.J. Walker (ed.), *Towards a Just World Peace: Perspectives From Social Movements*, Butterworth and Committee for a Just World Peace, London, 1987; André Gunder Frank and Marta Fuentes, 'Nine Theses on Social Movements', *Economic and Political Weekly*, 29 August, 1987; Majid Rahnama, 'NGOs: Sifting the Wheat from the Chaff', *Development: Seeds of Change*, No. 3, 1985; 'Swadhyaya: The Unknown, the Peaceful, the Silent Yet Singing Revolution of India', *IFDA Dossier*, Nos. 75/76, 1990; Pandurang Hedge, 'Appiko (Chipko) Movement: Lessons of Grassroots Action', in *The India Papers: Aspects of NGO Participation in Social Forestry*, Shekhar Singh (ed.), International Tree Project Clearinghouse, NGLS, New York, 1987; and Dilniwaz Variava, 'Dams, Environment and People: Influencing the Decision Makers in India', in *New Ideas in Environmental Education*, S. Briceno and D. Pitt (ed.), Croom Helm, New York, 1988.

For reflections that compel a reconsideration of "sustainability" and "environmentalism", see Claude Alvares, 'Gandhi's Truth', *The Illustrated Weekly of India*, 16 October, 1983; Sunderlal Bahuguna, 'Environment Conservation for Survival', *The Indian Journal of Public Administration*, Vol. 35, No. 3, 1989; Gustavo Esteva, 'Preventing Green Redevelopment', *Development: Seeds of Change*, No. 3, 1991; Ramachandra Guha, 'Ideological Trends in Indian Environmentalism', *Economic and Political Weekly*, 3 December, 1988; Vandana Shiva, 'Ecology Movements in India', *Alternatives*, Vol. 11, No. 2, 1986, *Staying Alive: Women, Ecology and Development*, Zed Books, London, 1988, and 'Conserving India's Forests, Protecting India's People', *The Indian Journal of Public Administration*, Vol. 35, No. 3, 1989.

There is a growing literature on the Narmada Story. What follows is a brief selection of some relevant or interesting titles: Claude Alvares, 'Surveyor of Doom', *The Illustrated Weekly of India*, 5-6 January, 1991; Claude Alvares and Ramesh Billorey, 'Damning the Narmada: The Politics Behind the Destruction', *The Ecologist*, Vol. 17, No. 2, 1987; Baba Amte, *The Case Against the Narmada Project and the Alternative Perspective*, Baba Amte Anandwan, Maharashtra, 1990; Marcus Colchester, 'The World Bank Ignores Human Suffering and is in Breach of International Law', *The Ecologist*, Vol. 15, Nos. 5/6, 1985; Kalpavriksh, 'The Narmada Valley Project: Development or Destruction?', *The Ecologist*, Vol. 15, Nos. 5/6, 1985, and *The Narmada Valley Project: A Critique*, 1988; Ashis Kothari, 'A New Bottle for the Same Old Wine: An Answer to the World Bank', *The Ecologist*, Vol. 15, Nos. 5/6, 1985, and 'Environmental Aspects of the Narmada Valley Project', *The Indian Journal of Public Administration*, Vol. 35, No. 3, 1989; Smitu Kothari, 'Cry, Our Beloved Narmada', *The India Magazine*, February 1991; Mahesh Pathak, *Environmental Planning for Sardar Sarovar Project*, Sardar Sarovar Nigam Ltd., Gandhinagar, 1989; P.A. Raj, *Facts: Sardar Sarovar Projects*, Sardar Sarovar Nigam Ltd., Gandhinagar, 1989; Shekhar Singh and Ashis Kothari, 'The Narmada Debate: Questions of Science, Democracy and Development' (Mimeograph). For other voices from grassroots groups struggling against the project, also see the newsletter of the Narmada Bachao Andolan, *Narmada*, Nos. 1-8, brought out by Kalpavriksh and Lokayan.

AMAZONIA

VOICES FROM THE RAINFOREST

A Resource & Action Guide

Edited by Angela Gennino

Published by the Rainforest Action Network.

The most comprehensive listing available of Amazonian and international groups involved in campaigning for the Amazon rainforest. It contains overviews of the various issues at play in the Amazon, plus many maps and photographs.

Send £4.50/US\$9 plus £2 (UK) or £2.50/US\$5 (overseas surface) p&p to: WEC Books, Worthyvale Manor, Camelford, Cornwall PL32 9TT.

Mad Cows and Warble Flies: A Link Between BSE and Organophosphates?

by
Mark Purdey

Many researchers believe that not enough is understood about BSE or "mad cow disease" to justify the complacent assurances from the Ministry of Agriculture, Fisheries and Food that the epidemic is under control. Important features of the epidemiology of BSE remain unexplained and MAFF is refusing to investigate a growing body of evidence that organophosphate insecticides may play a key role in the development of BSE in cows which are already rendered susceptible due to genetic factors and mineral deficiencies.

As the first blusterings of autumn hit the hill where I farm, the rickety skeleton of the milking cow finally collapsed in the mud. Her legs were emaciated and sprawled out, pathetically kicking. The vet from MAFF was called, and within the hour a fatal dose of phenobarbitone was injected to put the beast to sleep for ever.

A strange sense of anger surged up within me; not only was it anger for the loss of the companionship of a young pedigree cow, who not so many months ago was entering high summertime in her prime; but it was also anger for the way in which government scientists were evading some epidemiological factors which could hold important clues to the cause of the mysterious "mad cow disease", bovine spongiform encephalopathy (BSE).

The vet had no time for questions: "Just one more of the 70 cases a week which we're getting in Somerset." "The carcass will be beheaded tomorrow; head to the lab, body to the incinerator." All the pleas made to MAFF for various post mortem neuropathological explorations were rejected outright.

The infective agent which causes BSE is presumed to be a "prion", or "slow virus", a proteinaceous substance which contains no nucleic acid yet is somehow

able to multiply rapidly in its host after coupling with a protein found naturally in the nerves known as "PrP".¹ The prions are thought to make up in part the small fibres or "fibrils" which are the tell-tale sign of BSE-infected brain tissue. However, an ever-increasing number of cows being slaughtered for BSE symptoms are proving "BSE negative" at post mortem (they do not display the distinctive fibrils), thus throwing into serious doubt the established hypothesis for the cause of the BSE epidemic in Britain.

Initially, the cause of the epidemic was officially attributed to the relaxation of laws governing the heat treatment of animal protein ingredients for livestock feed at rendering plants. Tissue infected with the agent which causes the BSE-like disease in sheep known as scrapie is thus thought to have been incorporated into cattle feed. However, recent reports of cattle succumbing to BSE which had been born (from uninfected cows) *after* a ban on the inclusion of "animal protein" in livestock feed, throw this theory into considerable doubt. These reports also seem to refute MAFF's reassurances that the disease will die out when all the cattle born before the feed ban have died.

Even before the reports of post-feed ban BSE cases, there were good reasons to question the heat treatment theory: the original temperature required of the rendering plants (150 degrees Celsius) may not have been sufficient to inactivate the prion-infested sheep tissue, as prions can apparently survive for up to an hour at 360 degrees.² Moreover, several strains

of scrapie prion have been present in sheep food chains for over two centuries, yet cattle that have grazed the same contaminated pastures have, up until the last few years, not developed BSE.

Genetic and Environmental Factors

The cause of most epidemics can be ascribed to some alteration in environmental or genetic circumstances. However, much of the scientific establishment seems to be ignoring the importance of the genetic and environmental factors which influence slow virus diseases. Little research has been carried out on breeds of sheep such as the Dorset Down and Tigrée which appear resistant to scrapie.³ Likewise, little attention is paid to the vets and those working closely with BSE-afflicted cows who report that it is cows born with a "nervous" disposition or which are prone to the calcium-regulating, metabolic disease "milk fever", which prove to be the most susceptible to BSE.

Among the other issues which need investigating are the large differences in the incidence of BSE between different herds (some herds have been severely affected by BSE while others have not suffered a single case); and the geographic differences in the spread of the disease (the south-west of England, for example, is rife with it, while other areas have had comparatively few cases). These and other epidemiological factors show that there are likely to be environmental and/or ge-

Mark Purdey is an organic dairy farmer. He submitted a paper on the health effects of organophosphates to the House of Commons Select Committee on Agriculture in 1987 and has made several broadcasts on the issue. His address is High Barn Farm, Elworthy, Nr. Taunton, Somerset, England.

genetic variables which affect the chances of an animal succumbing to infestation with the BSE prion.

The Organophosphate Link

A striking feature of BSE epidemiology in Britain is that the epidemic is at its most intensive in the areas which were designated by MAFF as "warble fly eradication zones" approximately three years previously. Within these eradication zones, all farmers were legally obliged to treat their cattle with one of three pour-on quasi-systemic "phenylphosphorothioate" types of organophosphorus (OP) insecticide known as Phosmet, Famphur and Fenthion.⁴ OP insecticides exert their toxic effects by inhibiting acetylcholinesterase, an enzyme that regulates the transmission of signals along the nerves.

Every time that I have been able to chart the history of a cow that died of BSE, the cow has been treated with OPs during its life; usually three years prior to the onset of the disease. A farmer in the Taunton Vale in Somerset had one of his three farms included in a warble fly eradication zone in 1985. Whilst the replacement cattle which were moved onto the two farms outside the zone remained BSE free, a high incidence of the replacements which were moved onto the farm within the zone developed BSE a few years later. It may well not be a coincidence that registered organic farmers — who have avoided or refused to use OP substances (my own farm defeated 'The Warble Order' in a High Court judicial review in 1985) — have had no incidence of BSE in the cattle they have reared themselves, many of which have been fed on the bought-in concentrate feed which is supposed to be responsible for the outbreak.

Outside of the warble fly zones, organophosphates are applied less intensively but are nonetheless widespread. Farmers will voluntarily use Phosmet, Famphur, Fenthion and other types of organophosphates for controlling parasites such as lice, flies and worms in sporadic outbreaks all over Great Britain. On large "factory" farms, these chemicals are regularly applied prophylactically to the whole herd. Throughout the warble fly campaign, MAFF encouraged those outside the warble fly zones to treat their cows voluntarily with these chemicals. Similarly, the antelopes at London Zoo, in which BSE has been identified, are



Nigel Cattlin/Holt Studies International

The BSE epidemic is thought to be the result of feeding infected sheep remains to cattle as a cheap protein supplement. Sheep and cattle offal was banned from livestock feed in July 1988, yet, according to MAFF figures, the number of cattle dying from BSE before they reached four years increased five-fold between 1989 and 1991. Fifteen animals born after the ban are known to have died from BSE in 1991.

routinely exposed to wormers which target the nervous system.⁵ Cats, in which BSE has also occurred, are often exposed to OP insecticides in the form of flea collars.⁶

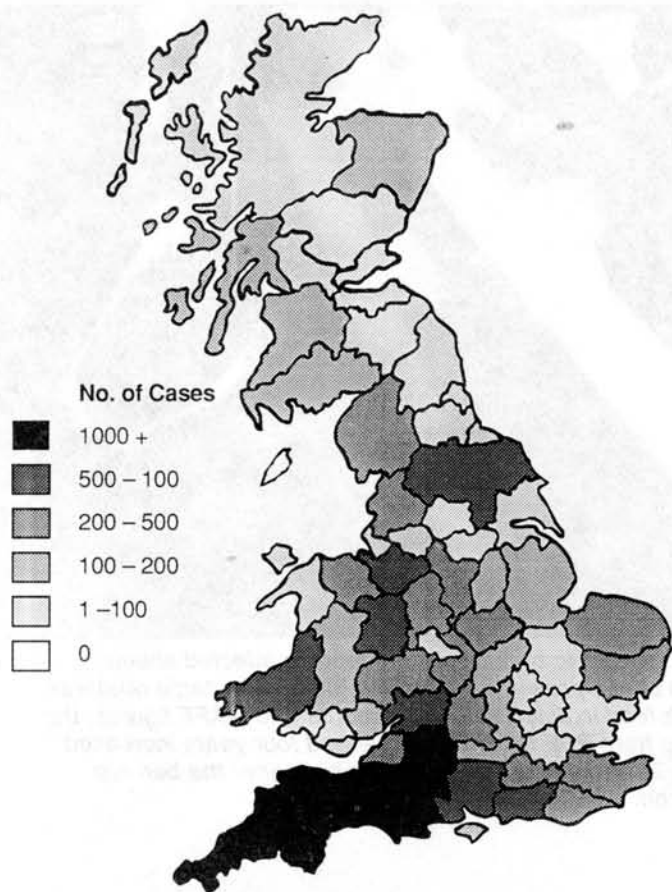
Neurological Effects of OPs

Acute poisoning by organophosphates causes the nerves to go into "overdrive" due to the excessive release of acetylcholine at the synapses (nerve junctions). While acute symptoms normally last for a few hours after exposure, some types of organophosphates are well known for producing a delayed neurotoxic effect in mammals often weeks, months, or even years after the exposure incident. Epidemics of delayed poisonings have been characterized by an ascending flaccid paralysis; these symptoms were seen in thousands of Americans who drank OP-adulterated "Ginger Jake" in 1930. In 1959, 10,000 Moroccans met a similar fate with OP-adulterated cooking oil. It has recently been claimed that OP-contaminated tomatoes may have provided the biochemical trigger to the "Spanish toxic oil syndrome" of the late 1980s.

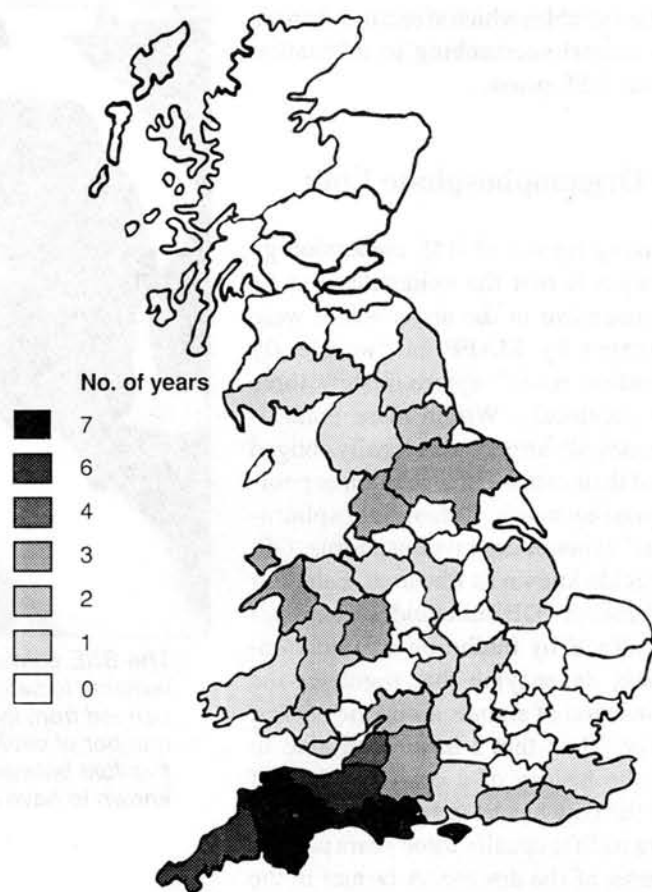
The pattern through which the nerves degenerate in these victims of OP precisely duplicates several types of motor neurone disease such as Friedrich's Ataxia and amyotrophic lateral sclerosis.⁷ Acc-

ording to Peter Spencer of the Albert Einstein College of Medicine in New York, victims of low-dose exposures to the OP military nerve gases have displayed symptoms of premature ageing, such as Parkinson's disease, several years after the actual exposure incident. Workers in plants manufacturing OP, and field-workers who have been accidentally exposed to one-off doses of OP, demonstrate a high incidence rate of many neurological and psychiatric disorders, including multiple sclerosis, schizophrenia, muscular dystrophy and motor neurone disease.⁸ Symptoms akin to those of myalgic encephalomyelitis (ME) have been linked to chronic exposure to vegetables treated with OPs.⁹ The role of OPs in these disorders suggests that the increased incidence of neurological and psychiatric disease in the Western world could be linked to the increasing residues of organophosphates in foodstuffs, water supplies and air.

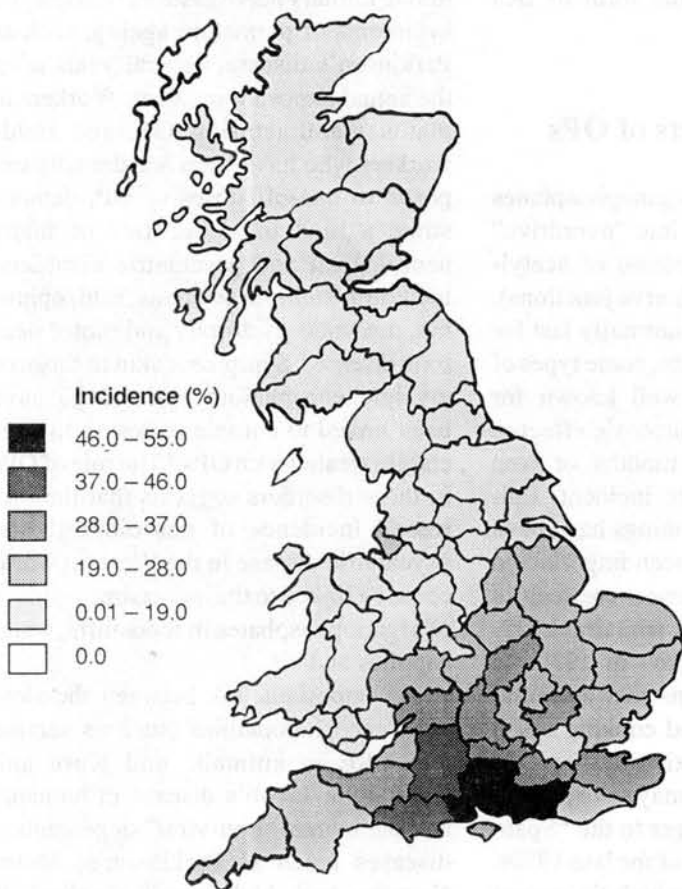
An important link between the slow viral encephalopathies (such as scrapie and BSE in animals, and Kuru and Creutzfeldt-Jakob's disease in humans) and the human "non-viral" degenerative diseases (such as Parkinson's, Motor Neurone and Alzheimer's disease), is suggested by the similar way in which all these diseases develop. Their onset is marked by a breakdown in the "axonal" transport of nutrients along cholinergic



Number of confirmed cases of BSE by county.
November 1986 - 31 December 1990.



Number of years that warble fly eradication zones have
been declared within counties (1984-1990).
N.B. Eradication zones only cover parts of counties and
OP warblecides are used voluntarily outside of the
compulsory zones.



Percentage incidence of dairy herds with confirmed BSE
by county. November 1986 - 31 December 1990.
N.B. Herds tend to be smaller but more numerous in the
south-western counties than in eastern England.

nerve fibres.¹⁰ Several external environmental agents such as aluminium, antibiotics, organophosphates, nutritional deficiencies and slow viruses, as well as genetic defects and trauma, have been shown to strike directly at the vehicles of this transport system thus leading to a steady starvation of the nerve cells and ultimately a degeneration of the entire neuronal system.¹¹ These toxins seem to impede the transport mechanism by disrupting the "neurofilaments" and the "microtubules" of the nerve cell. The toxins build up on the neurofilaments and burst out of the cells leaving a grotesque conglomeration of cellular remains or "tombstones" around each specific neuronal war zone. Each type of degenerative disease can be differentiated by its own characteristic type of "tombstone": Alzheimer's is characterized by neurofibrillary tangles and plaques; motor neurone by Bunina bodies and spheroids; Parkinson's by Lewy bodies; and the slow viral diseases by fibrils and amyloid plaques.

A Reduced Capacity for Detoxification?

Researchers at Birmingham University's Department of Biochemistry believe that both Parkinson's and Motor Neurone disease afflict people who carry unusual genetic variants of detoxifying enzyme systems which render them unable to break down and dispose of neurotoxins, such as pesticides, in the normal way.¹² Neurological disease in humans thus appears to be a response to the combination of environmental toxins with the

Organophosphates as Triggers of Neuronal Death?

One of the most important revelations this century in the field of neurodegenerative disease was made on Guam in the South Pacific. Before Guam was Westernized, the incidence rate of motor neurone diseases, Parkinson's disease and Alzheimer's types of dementia was 50 times higher among the Chamorro people on Guam than among people in the West. The incidence of multiple sclerosis was also higher on Guam, although to a lesser extent.

Following years of investigations, the cause of the diseases was pinpointed as an exposure in early life to a neurotoxic amino acid in the Chamorro's customary diet of cycad seed. The amino acid triggers the onset of these diseases up to 20 years after it enters the body. It appears to target specific, special-

ized zones of cholinergic brain tissue, with genetic variation between individuals dictating which type of disease eventually develops within the victim.

Cycad seed is also consumed in other pockets of the West Pacific such as West New Guinea and the Kii peninsula of Japan where the big three neurodegenerative diseases are also prevalent. All these areas are seriously deficient in calcium and magnesium minerals;¹ deficiencies which are considered to be the second essential prerequisite to the onset of the Guam degenerative diseases. Calcium and magnesium probably play a vital role as "cofactors" for activating enzyme systems which would normally detoxify the cycad "slow toxin" inside a healthy, balanced body.

A 1987 article on the Guam story by the eminent neurologist Roger Lewin,

concluded with the hope that the discovery of cycad toxin would spearhead "a search for similar toxic agents to which people are exposed in the West — a class of environmental chemicals that act as triggers for neuronal death".² The evidence from the BSE epidemic suggests that organophosphates may be one class of these neuronal triggers.

References

1. Gajdusek, M.D. 'Interference with Axonal Transport of Neurofilament as a Common Pathogenetic Mechanism in Certain Diseases of the Nervous System', *New England J. Med.* 312, 11, 1985; Calne, D.B., et al. 'Alzheimer's, Parkinson's and Motor Neurone Disease: Abiogenic Interaction Between Ageing and Environment', *The Lancet*, 8 Nov., 1986, pp.1067-1070.
2. Lewin, R. 'Experimental Hypothesis for Brain Diseases Strengthened by New Data', *Science* 237, 1987, pp.483-484.

possession of a reduced capacity for detoxification. There is evidence that there may be a reduced capacity for detoxification in the BSE cow due to a deficiency of calcium and magnesium.

During the years that my herd received concentrated feedstuffs (which, unknown to me, included animal protein), I reared approximately 350 cows on my organic dairy farm. Whilst none of these home-reared cows have to date developed BSE, a pedigree cow which I bought in from a non-organic farm did succumb to the disease. After this cow calved in January 1991, she went down with a severe relapse of milk fever where complex biochemical disturbances in the cholinergic nervous system¹³ (similar to that found in humans with Alzheimer's and Parkinson's disease)¹⁴ renders the cow unable to incorporate her calcium reserves into the routine metabolism of the nervous system. The cow was twice injected with calcium borogluconate and magnesium sulphate before she regained normal health.

During the following spring, the cow gradually developed the classic initial symptoms of BSE; these include apprehension, paranoid and aggressive behaviour, uncoordinated gait, eye flicking and loss of milk yield and quality. Interestingly, these symptoms were severely exacerbated by sudden changes in environmental circumstances such as the arrival

of wet, cold weather or movement onto fields that had just been treated with potash-rich organic fertilizers. These reactions would normally indicate the classic symptoms of chronic magnesium deficiency, so at the end of June the cow was injected with two bottles of magnesium sulphate. This caused a dramatic remission of the majority of neurological symptoms approximately 30 hours after the treatment. Despite witnessing the reversible nature of these symptoms, my vets diagnosed BSE in the cow. Their verdict was swiftly supported by MAFF vets who slapped a BSE Suspect Notice on the cow on 17 July. Much to the vets' surprise, the cow's condition improved after further treatment with both magnesium and calcium and the notice of suspected BSE was withdrawn at the beginning of September. However, the symptoms of the later degenerative stages of BSE — such as teeth grinding, dejection, weight loss and muscle atrophy — worsened in the animal, and on 29 September, after an extreme bout of wet weather, the cow collapsed and was slaughtered after the BSE notice was reimposed.

After this episode, I approached other dairy farmers and private vets who had been involved with BSE cases. Some of them also suspected chronic magnesium deficiency, and had produced a similar

dramatic alleviation of the initial symptoms by treating their cows with magnesium sulphate. These cows then went on to be diagnosed as "BSE positive" after slaughter. In response to a letter of mine pointing out this magnesium connection, the head of MAFF's BSE Epidemiology Unit, John Wilesmith, stated that in MAFF trials, therapy with magnesium had also resulted in a temporary remission of the clinical signs of BSE. It may well be relevant that BSE is most prevalent in the south-west of England where the soils are poor in calcium and magnesium.

As the initial neurological symptoms of BSE appear to be "reversible", the disruption in the early stages of the disease would seem to be made worse by some biochemically-based imbalance of the central nervous system, and cannot be attributed solely to the "irreversible" mechanical disruption of the brain lesions by prions.

Magnesium has long been understood for its role in regulating the output of nerve impulses. In 1954, it was demonstrated how magnesium ions were able to reduce the amount of acetylcholine being released at the nerve junctions, and how an intricate interrelationship with calcium ions maintains the neural equilibrium.¹⁵ More recently, researchers have shown that calcium and magnesium regulate the output of acetylcholine by stimulating

the output of cholinesterase, its natural regulating enzyme.¹⁶ Convulsions produced by the anti-cholinesterase toxin, eserine, have been shown to be blocked and stabilized by magnesium sulphate.¹⁷

The magnesium injections may therefore be rectifying some fundamental imbalance in the cholinergic nervous systems of these cows caused either by the deficiency of magnesium itself, and/or by some environmentally or genetically acquired cholinergic imbalance (a genetically determined cholinergic weakness is suggested by the susceptibility to BSE of nervous and milk fever-prone cows). Another possible explanation for the effect of the magnesium is that the BSE agent may disrupt the calcium and magnesium regulating parathyroid glands or the kidney's loop of Henle region.

Enabling Toxins to Bioaccumulate

The warble fly OPs, the phenylphosphorothioates, metabolize inside the cow into the more potently toxic "oxone". In a balanced physiological system, the oxone will then be degraded by a hydrolase enzyme system which requires, amongst others, calcium and magnesium as "cofactor" activators.¹⁸ Where calcium and magnesium are deficient, these fat soluble oxone metabolites will remain stable, bioaccumulate in the body fats and cross the blood/brain barrier into the central nervous system.¹⁹ The toxic "oxone" is then free to exert its diverse toxic effects on the cholinergic nerves of its host. The same biochemical basis of aberration could apply both to the BSE cow and to the Guam syndromes (see Box): the deficiency of calcium and magnesium could have starved the detoxification enzymes of their vital cofactors, so that toxins bioaccumulate in the body with catastrophic long term repercussions.

Organophosphates may well facilitate the entry of the prions into the cow. Although prions have an ingenious ability to deceive even the most healthy of mammalian immune systems, OPs may well disrupt the various physiological "ramparts" of defence, such as the blood/nerve and blood/brain barriers, and the cell membrane and gastro-intestinal barriers.²⁰ The mammalian protein, PrP, which exists in the membranes of nerve cells, is targeted by the prion infective agent, with which it combines to form the lethal multi-replicating agents that are the final cause

*OPs could be turning
innocuous, endemic
"Trojan horse"
contaminants in non-
nervous tissue into
lethal, multi-replicat-
ing agents which sever
the networks of the
central nervous system.*

of BSE. Because PrP has a role in the body for inducing cholinesterase receptors,²¹ it is highly likely that an OP toxin will also target PrP. Similarly, OPs inhibit the protease enzymes which normally degrade the PrP molecules, preventing them from choking up the nerve transport system.²² The presence of OP toxins in this vicinity could well explain some of the aberrant effects encountered at the secondary stages of the BSE syndrome.

In the slow viral diseases, there seems to be a prolonged incubation period before the infectious prion is "switched on" into a multi-replicating state by a gene in PrP known as the "sinc" gene.²³ This "cluster-bomb" effect of prions, once they have gained entry into the central nervous tissues, is believed to create the degenerative disease which ensues.²⁴ As OPs have been shown to cause "gene amplification" in cultured cells (a process whereby latent cancers are activated into a full-blown state of "multi-replication"),²⁵ it may be possible that they also in some way "switch on" the sinc gene in the cow.

BSE Negative Cows with BSE

In late 1991, the farming press was reporting an increasing number of cases where, to the puzzlement of the MAFF vets, cattle being slaughtered for BSE symptoms were proving BSE negative on post mortem.²⁶ On reading one of these reports, I contacted one of the farmers concerned who informed me that all three of his herds had been regularly treated with OPs, but it was the two herds which were farmed on clay soil which were producing the BSE cases. The herd on chalkland, which is rich in calcium and magnesium was relatively unaffected. Furthermore, the cattle on the clay farms

had many other health problems: "milk fever" was prominent and the cows were riddled with "rotavirus" infection and mastitis which could not be eliminated with antibiotics. The explanation for this may be that, on the clay farms, the OPs were able to exert their immunotoxic and other effects in the absence of the calcium and magnesium levels required for activating the cows' detoxifying enzymes.²⁷

The BSE negative cases may be due to the effects of straightforward organophosphorus neuropathy, whilst the "BSE positive" cases are due to OP neuropathy plus "prion" contamination. Many scientists believe that prions could be endemic to the environment at large,²⁸ in which case OPs could be turning innocuous, endemic "Trojan horse" contaminants in non-nervous tissue into lethal, multi-replicating agents which sever the networks of the central nervous system.

The most convincing neuropathological evidence for the BSE-OP link is that the features of OP neuropathy duplicate all the characteristic features of BSE brain tissue, except for the "fibrils", the distinctive "tombstones" of prion-infected brains.²⁹ One of these shared features which is baffling BSE researchers is the appearance of "ballooning" nerve cells or "vacuoles" in infected brain tissue. However, in 1979, Thomas Bouldin and J.B. Cavanagh from the London Institute of Neurology stated that "intranuclear ballooning vacuoles" in many regions of the grey matter of the brainstem were "unique" features only seen in victims of OP poisoning.³⁰

MAFF Refusal to Investigate the OP Link

Shortly after my cow was given its BSE Suspect Notice, a local MAFF vet claimed that the hypothesis of a link between pesticides and BSE was credible and would be researched once MAFF had seen my evidence. Two months later, having seen the evidence, my pleas for an investigation into the link were rejected.

Standard MAFF questionnaires to farmers with BSE cows only included questions on chemical exposure in the early stages of the investigation into the disease. Moreover, MAFF were only concerned with a link between BSE and "acute" chemical exposure,³³ rather than with the well-known "delayed" toxic effects of organophosphate poisoning. Yet, John Wilesmith, MAFF's chief epidemi-

ologist, claimed in a letter to me that my concerns and hypotheses have been covered by the Ministry's extensive, detailed research into BSE.

Many researchers are now convinced that the official explanation for the cause of the BSE epidemic is inadequate, and in particular that possible environmental factors are being downplayed. Given the available evidence, a link between BSE and organophosphate treatments is more than plausible, yet MAFF refuses to carry out the necessary research to prove or disprove the OP theory.

References

- Hope, J., et al. 'The Molecular Biology of Scrapie', *Trends in Neurosciences* 10, 4, 1987, pp.149-151.
- Dealler, S.F. and Lacey, R.W. 'Transmissible Spongiform Encephalopathies: The Threat of BSE to Man', *Food Microbiology* 7, 1990, pp.253-279. MAFF epidemiologists have recently suggested that the prions may have been destroyed by hydrocarbon solvents which were used in rendering plants up until around 1982 (Wilesmith, J.W., et al. 'BSE Epidemiological Studies on its Origin', *Vet. Record* 128, 1991, pp.199-203). MAFF have not published laboratory experiments on the destruction of prions by solvents.
- Eklund, C.M., et al. 'Slow Viral Diseases', *Crit. Revs. in Env. Control* 2, 4, 1972, pp.535-555.
- O'Keefe, M., et al. 'Fenthion Residues in Milk Following Treatment of Dairy Cows for Warble Fly', *J. Sci. Food Agri.* 34, 1983, pp.192-197. Before the advent of chemical sheep dipping (initially an organochlorine, Lindane, was used for dipping but this was later replaced by organophosphates), scrapie was largely confined to the Cheviot Hills on the Scottish border (*Black's Veterinary Dictionary*, 12th edition, A. and C. Black, London, 1976). Aluminium, which has an anti-cholinergic toxic effect (Marquis, J.K. 'Aluminium Inhibition of Serum Cholinesterase', *Bull. Environ. Contam. Toxicol.* 31, 2, 1983, pp.164-169) has been identified as an above average soil contaminant in the Cheviots. High soil levels of Al were considered a possible trigger for the pockets of neurodegenerative disease in the Western Pacific in the initial stages of research (Garruto, R.M., et al. 'Disappearance of High Incidence of Amyotrophic Lateral Sclerosis and Parkinsonian Dementia on Guam', *Neurol.* 35, 1985, pp.193-198).
- Bristol University Veterinary School, which is investigating several cases of BSE in cats, has not been able to inform me whether or not these cats were exposed to OP flea collars.
- Cavanagh, J.B. 'OP Neurotoxicity: A Model Dying Back Process Comparable to Certain Human Neurological Diseases', *Guy's Hospital Reports* 112, 1963, pp.303-319.
- Blisard, K., et al. 'Investigation of a Case of Alleged Insecticide Toxicity', *J. of Forensic Sci.* 31, 4, 1986, pp.1499-1504; Morgan, A. 'Neurological Problems Arising in a Plant Manufacturing Tri-Aryl Phosphates', *J. Soc. Occup. Med.* 31, 1981, pp.139-143; Metcalf, R. 'Historical Perspective of OP Ester Reduced Delayed Neurotoxicity', *Neurotoxicol.* 3, 4, 1982, pp.269-284; Gershon, S., et al. 'Psychiatric Sequence of Chronic Exposure to OP Insecticides', *Lancet*, 7191, 1961, pp.1371-1374;
- Adlakha, A., et al. 'Guillain Barre Syndrome as a Sequence of OP Poisoning', *J. of Physicians of India* 35, 9, 1987, pp.665-666; de Reuck, J., et al. 'Fatal Encephalopathy in Acute Poisoning With OP Insecticides', *Clin. Neurol. Neurosurg.* 81, 4, 1979, p.247; Waring, R., et al. *Lancet*, 12 Aug., 1989, pp.356-357; Waring, R., et al. *Lancet*, 19 Sept., 1987.
- Ratner, D., et al. 'Chronic Dietary Anticholinesterase Poisoning', *Israel J. of Med. Sci.* 19, 1983, pp.810-814; Hayes, M.M., et al. 'OP Poisoning in Rhodesia', *S. A. Med. J.* 54, 6, 1978, pp.230-234.
- Liberski, P., et al. 'Reevaluation of the Ultrastructural Pathology of Experimental Creutzfeldt-Jakob Disease', *Brain* 113, 1990, pp.121-137; Gajdusek, M.D. 'Interference with Axonal Transport of Neurofilament as a Common Pathogenetic Mechanism in Certain Diseases of the Nervous System', *New Eng. J. of Med.* 312, 11, 1985, pp.714-719; Droz, B., et al. 'The Importance of Axonal Transport in the Function of the Cholinergic Synapse in Normal and Pathological Conditions', *Prog. Brain Res.* 49, 1979, pp.23-44.
- Gajdusek, *ibid.*
- Waring, et al., op. cit. 8.
- Forslund, K., et al. 'Cholinesterase Levels in Cows Suffering From Parturient Paresis', *Acta Vet. Scand.* 24, 1983, pp.185-199.
- Ruberg, M., et al. 'Cholinesterase Activities in the CSF of Patients with Neurodegenerative Diseases Involving Cholinergic Systems', *J. Neurol. Neurosurg. and Psych.* 50, 1987, pp.538-543; Adern, A., et al. 'Extra Neural Cholinergic Markers in Alzheimer's and Parkinson's Disease', *Prog. in Neuropsychopharmacol. Biol. Psychiat.* 10, 1986, p.247.
- Del Castillo, J. and Engback 'Nature of Neuromuscular Block Produced by Magnesium', *J. Physiol.* 124, 1954, pp.370-384; Rahamimoff, R. 'Modulation of Transmitter Release at Neuromuscular Junction', in F. Schmitt and F. Worden (eds.) *The Neurosciences*, MIT Press, Cambridge, MA, 1974, pp.943-952.
- Kobayashi, K., et al. 'Stimulating Effects of Ca and Mg on Serum Pseudocholinesterase Activity', *Clin. Chem.* 34, 1, 1988, pp.173-174.
- Samardzic, R., et al. 'Inhibitory Effect of Magnesium Sulphate on the Vocalisation and Fighting Evoked in a Cat by Eseritic Treatment', *Crit. Revs. Soc. Biol.* 176, 1986, pp.278-282. Human victims of ME have improved considerably after magnesium therapy (Cox, I.M., et al. 'Red Blood Cell Magnesium to ME', *Lancet* 337, 30 March, 1991, pp.757-760). Mg deficiency has been thought responsible for aggravating the thiamine deficiencies which lead to Wernicke's encephalopathy in humans. The bovine equivalent of thiamine deficiency, cerebrocortical necrosis, was one initial explanation for the BSE syndrome.
- Ecobichon, D.J. *Pesticides and Neurological Disease*, CRL Press, Boca Raton, 1982, pp.161-163.
- Hall, R.J., et al. 'Bioconcentration of OP Pesticides', *J. of Toxicol. and Environ. Health* 6, 4, 1980, pp.853-860. Fenthion has been associated with abnormally prolonged toxic effects known as "the intermediate syndrome" of OP poisoning (Borowitz, S.M. 'Prolonged OP Toxicity in a 26-Month Old Child', *J. of Ped.* 112, 2, 1988, pp.302-4; Senorayake, M.D., et al. 'Neurotoxic Effects of OP Compounds: An Intermediate Syndrome', *New Eng. J. of Med.* 316, 13, 1987, pp.761-763). Several workers in Sri Lanka have developed prolonged muscle fatigue after handling Fenthion. The unpredictable toxic effects of this sub-group of OP chemicals may be due to unintentional contaminants developed during their production ('Hollingshaus, J.G., et al. 'Delayed Toxicity of Neurotoxicity of Phosphorothioate Esters', *J. of Toxicol. and Environ. Health* 8, 1981, pp.619-627; Toia, R.F., et al. 'Identification and Toxicological Evaluation of Impurities in Technical Malathion and Fenthion', *J. Agric. Food Chem.* 28, 1980, pp.599-604).
- Ecobichon, op. cit. 18, p.181; Damska, M., et al. 'Blood/Brain Barrier in Young Rabbit Brain After Dichlorvos Intoxification', *Neuropath. Pol.* 22, 7, 1984, pp.129-137; Russell, R., et al. 'Mechanisms Underlying Sensitivity to OP Anti-Cholinesterase Compounds', *Progress in Neurobiol.* 28, 1987, pp.97-129; Bouldin, T.W., et al. 'OP Neuropathy I and II', *Am. J. of Pathol.* 94, 2, 1979, pp.241-270; Yamada, S., et al. 'A Pharmacological Comparison of OPs and Carbamate Agents on Guinea Pig Elileum', *Toxicol. and Applied Pharmacol.* 64, 1982, pp.79-87.
- Hope, J., et al. 'The Key Role of Membrane Protein PrP in Scrapie-Like Diseases', *The Neurosciences* 3, 1991, pp.165-171.
- Seifert, J., et al. 'Possible Role of Microtubules and Proteases in OP Induced Neurotoxicity', *Biochem. Pharm.* 31, 11, 1982, pp.2065-2070.
- Hope, op. cit. 1; Dickinson, A.G., et al. *J. Comp. Pathol.* 78, 1968, pp.293-299.
- Chronic low level exposures of factory workers to Phosmet (one of the OP warblecides) and other organophosphate pesticides has produced chromosome aberrations at an intensive rate at a chemical works in Budapest (Kiraly, J., et al. 'Chromosome Studies in Workers Producing OP Pesticides', *Archives of Environ. Contam. Toxicol.* 8, 3, 1979, pp.309-319).
- Science*, 241, p.79.
- Harvey, J. 'Mystery Disease Kills Like BSE and is Baffling Vets', *Farmers Weekly*, 4 Oct., 1991.
- Katenovich, C.A., et al. 'T and B Immunity Systems in Pesticide Intoxication Sufferers', *Gigiena Truda i Professional'ny Zabol* 4, 1981, pp.17-19; Topilko, A., et al. 'Acetylcholinesterase in Human Thymus Cells', *Blood* 66, 4, 1985, pp.891-895; Esa, A., et al. 'Immunotoxicity of OP Chemicals', *Clin. Immunol. and Immunopath.* 49, 1, 1988, pp.45-52.
- Raine, C.S. in Schmitt and Worden (eds.), op. cit. 15, p.1043.
- Wells, G., et al. 'A Novel Progressive Spongiform Encephalopathy in Cattle', *Vet. Record* 121, 1987, pp.419-420; Wisniewski, H.M., et al. 'Increased Blood/Brain Barrier Permeability in Scrapie Infected Mice', *J. Neuropath. Exp. News* 42, 6, 1983, pp.615-626. The common features between OP neuropathy and BSE brain tissue are: 1. The impairment of axonal transport (Reichert, B., et al. 'Inhibition of Axoplasmic Transport by Delayed Neurotoxic OP Esters', *Mol. Pharm.* 17, 1980, pp.56-60; Seifert, J., et al., op. cit. 22; Moretto, A., et al. 'Progressive Deficit of Retrograde Axonal Transport is Associated with Pathogenesis of Dichlorvos Axonopathy', *J. Neurochem.* 49, 1987, pp.1515-1522; Mesulam, M., et al. 'Cholinesterases Within Neurofibrillary Tangles', *Ann. Neurol.* 22, 1987, pp.223-228). 2. Encephalopathies which exhibit spongiosis of the neuropil (de Reuck, op. cit. 8). 3. An increase in permeability of the blood brain barrier (Damska, op. cit. 20; Russell, op. cit. 20). 4. Proliferation of specialized glial cells on the brain (astrocytes and oligodendrocytes) (Bouldin, et al., op. cit. 20; Iroh, H., et al. 'Studies on the Delayed Neurotoxicity of OP Compounds II', *J. Toxicol. Sci.* 9, 1984, pp.37-50). 5. Neurofilaments and neurotubules aggregating in axons (Iroh, et al., *ibid.*). 6. "Ballooning" of vacuoles (Bouldin, et al., op. cit. 20).
- Bouldin, et al., op. cit. 20.
- Wilesmith, J.W., et al. 'BSE Epidemiological

Deforestation in Zaire:

Logging and Landlessness

by
John Witte

Having exhausted the timber resources of West Africa, logging companies are now turning their attention to the vast forests of Zaire. As the loggers advance, they pave the way for settlers who introduce forms of agriculture that further destroy the forest. This underclass of poor and landless farmers is the legacy of a corrupt social system, imposed by the Belgian colonialists, perfected by President Mobutu, and tacitly supported by Western commercial interests.

Increasing European concern about the fate of the rainforests has focused almost exclusively on the burning of Amazonia and the rapid logging of Malaysia's forests, while the destruction of the rainforests of Africa has been largely ignored. Perhaps it is easier to point the finger at Japanese excesses in Malaysia and cattle ranches in Latin America, than to look at the involvement of European companies in the destruction of Africa's forests. In the last decade it is Africa, not South-East Asia or South America, that has suffered the highest level of deforestation.¹ Over the 1980s, the fastest rate of forest destruction was recorded in Nigeria — not in Brazil, Malaysia or Indonesia. Nigeria is now 90 per cent deforested with a timber trade deficit of \$147 million.² Many agree that over 75 per cent of the forests of West Africa have been destroyed.³

With West Africa's forests devastated, the logging companies are now expanding their operations into the vast Central African forest, which is almost the size of Western Europe and represents 20 per cent of the world's total rainforest cover. At present, logging is concentrated on the western fringes of the Zaire river basin in Cameroon, Central African Republic and Gabon; but increasingly logging companies are turning to the vast interior of Zaire.

A 1991 Oxfam report concluded that "there is a major effort to open up Africa's forests to meet debt repayments and fuel future development", which will

"cause an increase in poverty rather than its resolution".⁴ This conclusion is supported by a report for the European Community which acknowledges that "forestry development and deforestation generally go hand in hand with the redistribution of wealth from the poorest... to a national élite and foreign companies (and) widen the gap between the rich and poor in tropical countries".⁵

Poverty in a Rich Land

Most African countries are confronted with a serious economic crisis characterized by heavy external debt, decreasing productivity, especially in agriculture, and increasing rural and urban poverty. Meanwhile, the minority ruling class "has almost confiscated the state apparatus to realise its personal interests and wealth accumulation".⁶ This is nowhere more evident than in Zaire, whose foreign debt of \$8 billion, accumulated through the establishment of inappropriate prestige projects and the need to import food, is considered to be less than the personal fortune accrued by President Mobutu during his 26 years in control of the state apparatus.

Zaire (formerly the Belgian Congo) is Africa's third largest country with over 200 different ethnic groups. It is the size of Western Europe, yet has a population of only 34.5 million people, compared to Western Europe's 337 million. Zaire contains 12.5 per cent of the world's remaining tropical rainforest; only Brazil

and Indonesia have more. As well as its immense forests, it has vast deposits of cobalt, copper and diamonds, and its network of rivers are a natural transport system and a huge potential source of hydroelectric power.

Seventy per cent of Zaire's population is involved in subsistence farming on its fertile lands. The diversity of its climate and geography allows the production of a wide range of food and cash crops.⁷ Yet real wages are a tenth of what they were at independence, malnutrition is chronic, and 80 per cent of people live in absolute poverty.

Zaire has for many years been in the grip of a social system based, not on the accumulation and investment of capital, nor on a strong political structure, but on the intentional creation and perpetuation of insecurity at all levels of society. The Zairian system of government is often described as a "kleptocracy", and Mobutu at its top is referred to by Zairians as "*le grand voleur*" — "the big thief". The state operates through a corrupt hierarchy of institutionalized theft, involving the relentless appropriation of money, labour and fertile lands by those in a position of power. The forcible seizure of land for logging, plantations and other lucrative activities has created a class of dispossessed poor, whose only option is to move along logging roads and other roads into the forest.

The Zairian kleptocracy is not, however, Mobutu's creation; it can be traced directly back to the early days of colonialism, and to the reign of Leopold II of

John Witte is a pseudonym.

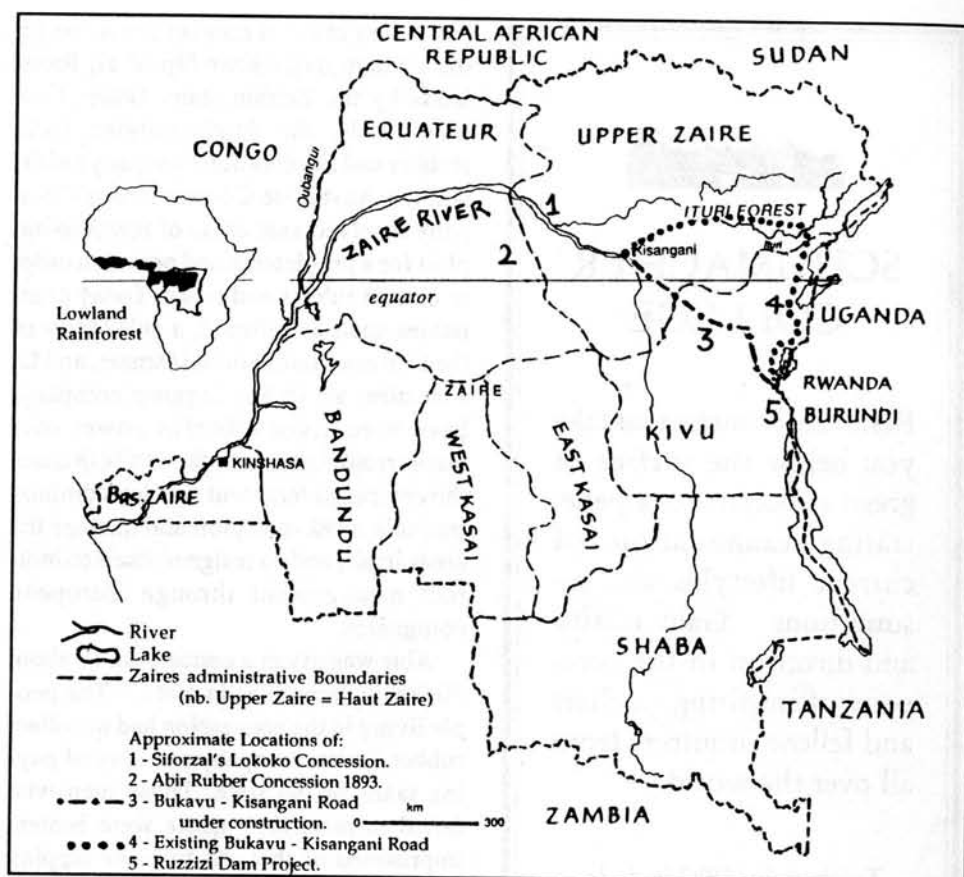
Belgium in particular. If we are fully to understand the causes that today push cultivators into the forests along the loggers' roads, we must look at the ways in which the traditional political structures and land tenure systems were forcibly changed by the Belgian colonialists, and the effect that this has had on present-day land use and ownership.

Traditional Systems of Land Ownership

For several thousand years, until it was destroyed by colonialism, a robust Western Bantu political tradition flourished in Equatorial Africa. Bantu cultivators and fishers traded iron and pottery artefacts and agricultural produce for the forest products of the hunting and gathering Pygmies or Forest People (about 200,000 of whom still live in the forest region). This economic and cultural exchange was often mutually beneficial, and in places such as the Ituri Forest of northern Zaire it continues to this day. The Forest People's traditional system of land ownership differs from that of the farming people in so far as their corporate rights to land are not related to cultivation but to gathering, fishing and hunting; and in that they see themselves as dependent on the goodwill of the forest itself rather than on the goodwill of their ancestors. However, their traditional rights to land rest on the same combination of defined territories and flexible group membership as do those of neighbouring farmers.

In a study of the land tenure systems of four Zairian ethnic groups, Robert Harms concluded that land is traditionally held by small groups which are constantly dividing, merging and shifting; and the person responsible for land is relatively low in the political hierarchy. This is because of the prevalence of shifting agriculture, which means plots are cultivated only temporarily; and of the low population density, which means new plots are easily found and there is consequently little interest in maintaining permanent rights to land.

"Almost everywhere in Zaire large tracts of land are held by corporate groups. Individual parcels for cultivation within a tract are redistributed to the members of the group according to local laws each time the soil becomes exhausted in one place and it becomes necessary to set up new fields. Sometimes individuals move



their fields, while at other times the whole village moves, causing a complete redistribution of the land. In the majority of cases the corporate group that holds the land is the lineage, though sometimes it is a political chiefdom. The land held by the group has fixed boundaries, either clearly defined geographical features or imaginary lines."⁸

According to Bogumil Jewsiewicki:

- "From the point of view of social relationships the rationality of shifting agriculture was evident. It preserved a supple relationship between lineage or clan groups and villages. . . The traditional mechanism for the solution of conflicts had been the break up of groups."⁹

The establishment of Belgian rule, which forcibly kept people in the villages, halted this traditional means of resolving conflict and encouraging social relations.

The Congo Free State

In the second half of the 19th century, there was a sudden rise in Western demand for African gathered and hunted materials, primarily rubber and ivory. Swahili merchants from East Africa, and

European merchants and state representatives, sought to extract and transport these products through enslaving or employing African labour. The demand for raw materials and the competition between colonial powers led to the formation of colonial states, which took over the region's economic resources. In Zaire, this began in 1885, with the imposition of the Congo Free State, the personal possession of King Leopold II of Belgium. The Free State became notorious, even in the heyday of colonialism, for cruel and violent exploitation. According to Roland Oliver, the Congo suffered more severely than any other area of Africa during the early years of colonial rule; its only tangible wealth was in wild rubber and ivory, which could most easily be obtained by forcing the agricultural peoples of the riversides, often at gunpoint, to move into the forest to gather and hunt these products. Oliver believes that the forest population may have been reduced by half during this period.¹⁰

In 1885, the Congo Free State seized all so-called "vacant" land, and in 1890 declared itself to be the owner of all natural products of the forest. Although the State generally recognized cultivation rights on cleared land, it completely ignored gathering rights, which were equally well defined and regulated by



SCHUMACHER COLLEGE

Residential courses that take you below the surface of green concerns to a penetrating examination of current lifestyles and assumptions. Gain clarity and direction in the company of inspiring teachers and fellow inquirers from all over the world.

Teachers for 1992 include:

**Arne Naess
Kirkpatrick Sale
Anthony Rooley
Fritjof Capra
Patrick Pietroni
Vandana Shiva
David Bohm
Wendell Berry
Charlene Spretnak
Herbert Girardet
Victor Papanek**

For further details please
contact:

*Hilary Nicholson,
Department E,
Schumacher College,
The Old Postern,
Dartington, Totnes,
Devon TQ9 6EA*

*Telephone (0803) 865934
Fax (0803) 866899*

customary law.¹¹ It thus set the scene for the modern day ownership of all forest lands by the Zairian state. Under Leopold's rule, the Anglo-Belgian India Rubber and Exploration Company (Abir) and the Anveroise Concessionary Company received vast areas of forest to exploit for a pre-determined period in order to extract rubber and ivory. Today companies such as Siforzal, a subsidiary of the German multinational Danzer, and La Forestire, an Italian logging company, have been given effective power over huge areas to extract timber. In both cases the central government was too administratively weak to exploit and manage the areas itself, and so resigned itself to indirect management through European companies.

Abir was given a concession of about 30,000 square miles in 1983.¹² The people living in the concession had to collect rubber for the company as a way of paying taxes to the state. Those men who failed to meet their quota were beaten, imprisoned or shot. As frequent tapping caused the supply of rubber to become exhausted, men had to work nearly full time to fulfil their quotas. There was no time to clear new fields for the women to cultivate, and famine occurred.

In 1908, the Congo Free State became the Belgian Congo, when the Belgian Government took over the administration of the territory from the discredited King Leopold. Two years later, it became apparent that the rubber in Zaire was being depleted. The rubber tax was abandoned, and in 1911 the British company, Lever Brothers, were given 750,000 acres of the best palm groves on the "vacant" lands. Despite the fact that each of the groves was already owned by a local person or lineage, Lever claimed ownership of all palm groves that were not directly joined to villages. The government then instituted a tax in money to force people to work for Lever, and again people often abandoned cultivation, having to work full time for the company in order to pay their taxes.¹³

In the eastern Congo, farmers were forced to grow rice and other food crops, initially to feed troops and porters stationed there during World War I, and subsequently to feed the populations of the mining and urban areas. Cotton was introduced to the Congo in 1915, and each subsequent year villagers were required to extend their cotton fields in order to pay their taxes. The obligatory cultivation of cash crops greatly expanded

the amount of land under cultivation and caused farmers to plant on fallow land long before it had recovered. The result was a continuous degradation of the soil, widespread undernourishment of the people, and rural depopulation.

In the Congo Free State, chiefs were the mainstay of government rule and labour policy. They often struggled to defend their people, while meeting enough of the excessive demands of the colonial authorities to retain their position. David Northrup describes how many rulers "passively resisted the ever-growing government demands for rubber, porters and food in an effort to retain the support of their subjects but soon found themselves displaced or replaced by government appointees".¹⁴ Colonial officials often negotiated land agreements with these puppet chiefs, despite the fact that the traditional owners were generally much lower in the political hierarchy than the chiefs.

All Africans were excluded from credit, from private ownership of land and from the right to hire employees. Punitive taxes were introduced specifically to bankrupt African small businesses and so prevent the emergence of an African middle class. The learning of French was restricted to urbanized Africans, so that the different ethnic groups in the countryside would not develop a common language. The policy of "indigenization" divided people into small cultural units, tying them for life to their village and group of ethnic origin.¹⁵ Migration was controlled by passes to impede people fleeing from taxation and from obligatory cultivation or road work.

Belgian rule destroyed the dynamic nature of the traditional political and land owning system. It blocked any creative adaptation to the impact of Western institutions and demands, by maintaining a stifling system of government-appointed chiefs, taxes and laws, and by its underlying paternalism which, at best, treated the Africans as children who could never grow up.

Mobutu's Use of State Power

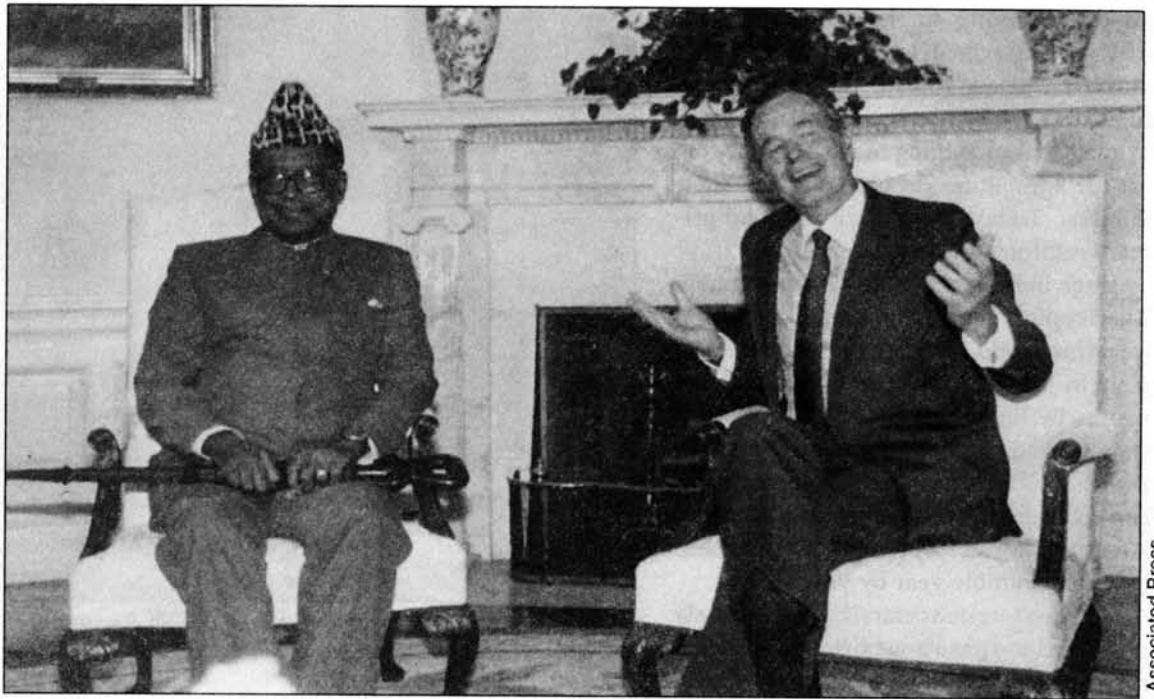
On the 30th June 1960, the Congo achieved independence under the radical government of Patrice Lumumba. But a week later the army mutinied against its exclusively European officer corps, plunging the country into civil war. To contain the situation, Lumumba placed

the army in the hands of some former NCOs, led by Mobutu. But Lumumba was deposed by this faction, and subsequently murdered. After five years of conflict, Mobutu, aided by Belgian and American troops, seized power.

Mobutu's promise to impose order by establishing a strong, depoliticized regime was overwhelmingly welcomed by a people sick of civil war. Parliament was dissolved, and the independent judiciary abolished. In 1967, Mobutu established a one party state, under the Mouvement Populaire de la Revolution (MPR). For a while the economy appeared to recover, but

Zaire rapidly built up a massive external debt to fund prestige projects such as the huge dam at Inga on the lower Zaire, or to buy industrial plant that was heavily reliant on imports. Mobutu consolidated his position by co-opting radicals and would-be opponents into his regime, a practice that proved very successful up until the last couple of years. He changed his ministers and military commanders every two or three years so that they would not create a power base to threaten him, even though it meant having no continuity in administration. The centralization of state power was accompanied by a concentration of economic revenues in the small circle around the President.

Meanwhile wages fell, agriculture was completely neglected, and the economy collapsed. This provided the justification, in 1975, for further "radicalization", in which the government took over more enterprises. This massive dislocation of the commercial economy coincided with the copper price-crash; and, a year later, many of the businesses had to be returned to the original owners in order to keep the economy going. The new Zairian partners maintained a 60 per cent stake, however, and in this way the President himself acquired a large stake in many huge concerns. These included the major logging enterprise Siforzal; the plantation empire Celza, which is Zaire's third largest employer and produces about one-



Presidents Bush and Mobutu share a joke at the White House in 1989. Since 1965, when Belgian and American troops helped to bring him to power, Mobutu's regime, despite its catalogue of human rights abuses, has been supported by the West as a rampart against the spread of communism.

Associated Press

sixth of the country's agricultural exports; and Pharmakina, a subsidiary of Bayer.

By 1988, Zaire's debt had reached \$5 billion, a sum estimated to be roughly equivalent to the amount the President had stolen from the country. Meanwhile, five per cent of the country's profits from minerals were being paid into his overseas accounts, and in 1990, 30 per cent of the country's operating budget was estimated to be passing through the Presidential office with no further accounting. Yet, for many years, Mobutu's position was never seriously challenged. During the Soviet-Cuban intervention in the Angolan civil war and then in Ethiopia, he was able to present himself to the West as the only alternative to chaos and communism in Zaire. With support from abroad, as well as from his own extensive security network, Mobutu's survival, until very recently, was never in doubt.

The Spread of Logging

At present, logging in Zaire extracts only 500,000 cubic metres of timber a year, compared to Indonesia's annual export of about 40,000,000 cubic metres. Zaire lacks the infrastructure to handle much more than this, and consequently 86 per cent of Zaire's rainforest is still intact. There are just over 6,000 kilometres of railways in five separate and rarely func-

tioning sections, and only 2,400 kilometres of roads, in a country five times the size of France. The Zaire River and its tributaries are the main transport network. It is navigable from Kisangani in the north, to the capital, Kinshasa, in the south-west; but the rapids below Kinshasa force all the timber to go overland by inefficient road or rail transport to the port of Matadi.

Zaire allocates its logging concessions on a 25-year lease. In theory, Western logging companies will return to take a second cut, but in reality this never happens, since the amount of forest destroyed in the first cut, and the influx of shifting cultivators, means that there are no valuable trees left for a second cut. Only the best trees are taken — the average is 8.7 cubic metres, less than one tree, per hectare — and this low yield effectively quickens the pace at which further rainforest is opened up. Logging is thus both highly selective and completely unsustainable. Since the massive trunks can only be taken out of the forest on feeder tracks and logging routes before travelling down river, these selectively logged areas are criss-crossed with roads.

The heaviest logging has occurred in the region of Bas-Zaire, close to Kinshasa and its ports; and settlers have followed in the wake of the loggers to clear extensive areas for farming. Logging companies pay Zairian workers the least they can possibly get away with, and feel

no responsibility to their workers once they have finished logging an area and moved on. Those who have moved into the forest to work for the company often have to switch from logging to clearing the forest for agriculture, in order to feed their families. Today, there is virtually no primary rainforest left in Bas-Zaïre.

Huge increases in logging are planned. The Tropical Forestry Action Plan for Zaïre, which held its final meeting in 1990, plans to increase logging to 5,000,000 cubic metres by the year 2020. The TFAP also suggests the "promotion of Zaïrian timber in the ... EC, US and Japan", where "Zaïre can recuperate the markets" of the major African producers of the 1970s, whose exports "crumble year by year".¹⁶

The vast forested central basin is sparsely populated and has a nonexistent or abysmal road system. The TFAP plans a "road network in the interior of the country" as far east as Haute-Zaïre. The Kisangani-Bukavu road, already being constructed by the Chinese and the Germans, will permit an increase in the export of timber to East Africa from its present low level. Thirty-seven per cent of the total exploitable area of Zaïre's rainforest has already been allocated as timber concessions (in the neighbouring Central African Republic the figure is 90 per cent).¹⁷ Eleven German, French, Belgian, Italian and other foreign-based companies or joint-ventures account for 90 per cent of logging in Zaïre. Of these companies the largest is Siforzal, which accounts for 40 per cent of Zaïre's logging, and has ten concessions, mostly in Équateur and Haut-Zaïre provinces, three of which are over one million hectares in size.

Timber from Africa's rainforests is exported in its cheapest, raw material form. Of EC timber imports from Central Africa, 1,726,000 cubic metres arrives in the form of raw logs and 213,000 cubic metres as sawn wood. In contrast, the EC imports 6,800 cubic metres of raw logs and 1,356,000 cubic metres of sawn wood from its second largest supplier, Malaysia. In Zaïre, for exports worth \$16 million a year, Siforzal pays less than \$10,000 to Zaïre's government.¹⁸ Of the taxes the government receives, far more goes into the President's personal account than is spent on education, health and transport combined. Few of the profits from logging reach the local population.

Land Concentration in Kivu

The pressure of increasing landlessness



The aftermath of looting in Kinshasa, in September 1991. Mobutu's edifice of corruption and repression is looking increasingly fragile as opposition grows, both in Zaïre and abroad.

upon the forest is nowhere more evident than in the province of Kivu, which borders Uganda, Rwanda, Burundi and Tanzania.

Kivu is highly fertile, a fact which did not escape the notice of the Belgian colonialists. In 1927, the administration of the Belgian Congo gave tax and plantation rights in Kivu to a private company, Comité National de Kivu (CNKi). However, they were only allowed to occupy "vacant" lands, far from the relatively heavily populated areas, which were most favourable for Arabica coffee production.¹⁹ CNKi therefore had cultivated land declared "vacant" by corrupt chiefs, and then set up their own plantations on it. The chiefs benefited through "selling" land that was not really theirs; especially land belonging to their political rivals.²⁰

The plantations of coffee, tea and cinchona (quinine) were very labour intensive. Recruitment to plantations was achieved initially through forced labour; and later through the raising of taxes, combined with the destruction of any alternatives to paid labour on the plantations or in the mines. From 1937 until 1956, the labour shortage was partly solved by the relocation of populations from the densely populated regions of Rwanda and Highland Bwisha. Land was forcibly reallocated to the immigrants, to the benefit of the chiefs and the detriment of local people.

The means used in the colonial period to force people into paid employment are still in use today. State and

local authorities collaborate in forcing people off their land. Those with power, wealth and influence, are now more than ever able to manipulate the land grant system to appropriate occupied land. The local élite claim the land is theirs by tradition, while the state élite uses state laws and central government influence to support their claims; the original farmers often end up as dependent labourers. Since land is increasingly valuable, "repression, including arrests, extortion and crop destruction have been employed against peasants who have refused to abandon their homes and fields. Many have been forced off the land; others now work in exchange for squatter's rights."²¹ By creating a dispossessed landless class, the landowners can pay low or no wages by offering people land to cultivate, in return for personal security and labour obligations.

In Kivu, concessions for ranching (and consequently the appropriation of land) are in increasing demand by those with influence in the state system:

"In the highlands of Kivu, home of a principal immigrant group, the Nande, an expanding entrepreneurial class is buying up land from village chiefs to convert it into cattle ranches and plantations. A study by a Nande anthropologist found that as early as 1980, 25 percent of Nande farmland in the zones of Beni and Lubero (in Kivu) was owned by wealthy businesspeople and private cash croppers. Land put into cattle ranches is often very inefficiently used or left unexploited, thus locking up land that

could be used more efficiently and sustainably for food production. The resulting land scarcity leaves few choices for Nande rural producers; it is leading to their dispossession and immigration onto the lowland forest frontier."²²

Agricultural land has also been lost to various aid projects. The loans for small scale projects such as roads and buildings have benefited the local kleptocratic elite and enabled them to take over large amounts of land. Larger schemes are imposed at the international level. Most prominent of these is the Ruzizi dam in Kivu on the Zaire/Rwanda border, funded by the World Bank. In 1989, six years after the project was approved, no resettlement and rehabilitation plan existed. The number of people to be displaced had originally been estimated at 200. In fact, "a total of 12,600 people suffered expropriation of their property and productive farmland. They were left with inadequate or non-existent compensation in one of the most densely populated and cultivated areas of Zaire."²³

The situation is aggravated by the continual conflict between different ethnic groups. Often one group will claim traditional land rights over an area, by insisting that other groups are untitled immigrants. In many cases, the only recourse of the poor is the Catholic church, but in its battle against ancestor worship the church usually opposes traditional land claims and supports those who have purchased land contrary to customary land rights. Although in some cases this may protect poorer immigrants from dispossession, it may equally support the moneyed elite against poorer farmers' traditional land claims. James Fairhead points out that different church sects have often come to represent different ethnic groups, supporting different land claims.²⁴ He also documents the continuing existence of compulsory labour and the violence meted out to villagers by the army, secret police, gendarmes and state officials.

Pressure on the Ituri Forest

Sixty years of exploitation and corruption in Kivu have left vast numbers of people landless and powerless. The result is poverty in the midst of plenty:

"Outside observers are sometimes astonished when malnutrition or famine is talked of in Kivu. It is a region where strawberries are har-

vested all year round, where quail's eggs and luxurious fruits and vegetables of every description are packaged and shipped to Kinshasa, and where rich soils and abundant rainfall leave the landscape green and lush. It is a region which commonly feeds Kinshasa and Rwanda with its 'surplus', earning it the title of '*Grenier du Zaire*' (Zaire's Granary). Kivu is simultaneously 'food deficit' in aggregate statistics, and yet a food exporter, which indicates that food security there is not just about aggregate food supply, but about access to that supply."²⁵

The lack of access to food, the insecurity of land tenure and the climate of political corruption are all placing increasing pressure on the forest in Kivu and the Ituri forest in Haute-Zaire. In 1971, the town of Oysha in North Kivu was completely surrounded by forest; today the women have to walk more than 15 kilometres to reach the forest and collect firewood. From Oysha south to Beni the Zairian firm ENRA has replaced almost the whole forest with tea and coffee.

ENRA are also logging in this area, exporting the timber to East Africa. The building of logging and other roads, enables people to move from Kivu into the Ituri and other forested regions, threatening the forest and the livelihood of its traditional inhabitants. The forest is also cut to supply the more populated areas with charcoal and firewood or to clear land for cultivation. These activities put pressure on the Forest People and other hunters to provide more meat for the incomers, and to export to the towns.

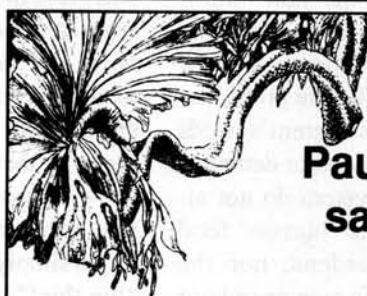
Gold is another attraction in the Ituri Forest. The Nande people are as much drawn by the possibilities of looking for gold or clearing the forest for large plantations, as they are by the pressure on land in the areas of Kivu from which they originate. Indeed, Janet MacGaffey has described how successful they have been as an ethnic group trading between

Kivu to the east of the Ituri and Kisangani to the west.²⁶

However, the basic pressure on the Ituri Forest is from the unequal distribution of land in Kivu. The continuing concentration of land ownership, the growing of cash crops, the expansion of ranching, and the general insecurity fostered by those in power, forces farmers in Kivu into either becoming dependent labourers or else migrating into the forest.

Richard Peterson has studied the effects of immigrant agriculture in high population density areas in the Ituri Forest. He explains how incoming farmers

"...practise both more extensive and intensive agriculture than the Ituri's indigenous farmers, for whom agriculture is just one among several forest-based means of subsistence, along with trapping, fishing and gathering. These activities, coupled with exchanges with Mbuti, allow the indigenous farmers to survive on relatively small fields. In contrast, for many immigrants coming to the



What Paul Ehrlich said about us:

"I think a lot of scientists like me depend upon **WORLD RAINFOREST REPORT** for information on what's happening. It's very difficult for professionals to keep track of all the details in the vast array of atrocities committed in our rainforests...(World Rain forest Report) has become a sort of central (agency) in keeping people up to date."

We hope you'll pardon our boasting but...as well as Mr. Ehrlich...scientists, activists, politicians and the environmentally concerned public in 80 countries look to **WORLD RAINFOREST REPORT** as their source of accurate, up-to-date information on these vital areas of the planet, as well as for articles on deep ecology, the global environment and social change.

Subscribe today to stay fully informed and to find out how you can contribute solutions and help significantly.

WORLD RAINFOREST REPORT

Please add me to the list of subscribers to **World Rainforest Report**. I enclose a cheque in Australian currency to the Rainforest Information Centre, P.O. Box 368, Lismore, NSW 2480, Australia. \$15 (Aust.) or \$25 (Overseas).

Name:.....
Address:.....
Country:.....

Ituri, agriculture is their primary economic activity . . . [Their fields] are an average of 10 to 25 percent larger than those of local farmers . . . Larger garden plots, coupled with rising populations in villages experiencing immigration, increase the extent of primary forest clearing dramatically . . . The use of longer farming periods per field, with shorter or no use of fallow . . . can also cause the soil to deteriorate to the point of permanently preventing the forest from regenerating naturally.

"Immigrants also bring with them the cultivation of cash crops, most notably coffee, and to a lesser extent, oil palm and beer bananas . . . In Eringeti, the study site experiencing the most advanced immigration, garden clearing has been extended from five to fifteen kilometres on each side of the road in less than two years."²⁷

Traditionally, there has been a continual exchange of garden and forest produce between the farmers and the Mbuti Forest people, which has also involved the Mbuti working for specific farmers at certain times. But now, since the new immigrants have less need of forest products, the Mbuti have less bargaining power. "It is primarily the Mbuti who are providing a cheap labor pool for immigrant's needs . . . The rigidity and heavy labor demands of the wage-for-labor system do not allow Mbuti the freedom to 'borrow' food from the villager's gardens, nor the flexibility to follow their own agenda of hunting and gathering."²⁸ The Mbuti are left alienated and far less independent, with the forest on which they depend shrinking fast.

After Mobutu

There is a growing international consensus that unsustainable logging must be stopped and that solutions must be found to halt the influx of the landless into the forest. Some suggest that this could be achieved by reimbursing governments through "debt-for-nature" swaps, whereby Third World debt would be cancelled in exchange for the creation of protected forest areas. Another solution put forward, is to provide financial incentives for companies to pursue sustainable timber production in areas that have already been devastated.

It is vital, however, to recognize that sustainable logging can only be achieved if it takes into account not just the need to

stabilize logging, so that it can maintain a sustainable yield of timber into the future; but also the needs of the local people to establish a secure livelihood, and to maintain the vital functions of their local ecosystem. In these terms sustainability is only possible when it is the local people themselves who benefit from both logging and other forest product revenues, and from the maintenance of their long term financial, social and ecological security. This, in turn, is only possible if measures are taken to institute land reform, redistribute wealth and ensure secure livelihoods in those areas which the landless settlers are fleeing. In this sense the protection of the environment goes hand in hand with democratization and the alleviation of poverty.

At the time of writing in February 1992, inflation is out of control, food is scarce, the mines are closed, and the shops in Kinshasa and the other main cities have been looted systematically by the army and the poor. Mobutu is working to divide the opposition, but it seems unlikely that his promise of multi-party elections will stave off his downfall. If it is true that revolutions are born out of the fusion of hope and despair, then Zaire is set to explode. But given the continuing Western demand for timber, copper and cash crops at the lowest possible prices, and the well-established hierarchy of corruption, it is very possible that a new regime might simply replace Mobutu with another "big thief".

The gradual ending of white rule in South Africa, the people power movements of Eastern Europe and the end of the Cold War have led directly to a situation in which Mobutu's regime might topple. The "Sacred Union", a movement for the introduction of multi-party democracy, is gathering support. But in order to ensure the political security that may be possible with the introduction of democracy, and subsequent environmental and economic security, the international context may prove to be critical. Altering the exploitative relationship between North and South, putting environmental sustainability high on the agenda, and replacing Cold War paranoia with positive support for democratic institutions, may be the long overdue apology the West owes to the people of Zaire, from whom it has attempted to steal both their past and their future.

Notes and References

1. Martin, C. *The Rainforests of West Africa*, Birkhauser, Basel, 1991. Expressed as a percentage of the original forest area. There are different criteria for measuring the level of deforestation in Africa. Some analysts only include "complete clearing of tree formations . . . and their replacement by non-forest land uses"; by this definition, commercial logging in Africa, which is based on taking out only the best trees, cannot in itself be termed deforestation. But others include within their definition forests which have been degraded by logging or other activities, even though they may not have been entirely converted to other land uses. In the long run, the distinction may be academic: the "opening up" of African forests by logging companies has almost always been followed by the movement into the forest of the poor.
2. Myers, N. *Deforestation Rates in Tropical Forests and their Climatic Implications*, Friends of the Earth, London, 1989, p.30.
3. Lewis, D. personal communication, 1992.
4. Beauclark, J. *Hunters and Gatherers in Central Africa: On the Margins of Development*, draft of report produced for Oxfam, 1991.
5. European Parliamentary Committee on Development and Cooperation, European Parliament, Sept. 1990, cited in Beauclark, *ibid.*
6. Kalala, K. 'Actual Situation of Agriculture in Sub-Saharan Africa: The Case of Zaire', *African Study Monographs* 10, 1, May 1989, p.8.
7. *Ibid.*
8. Harms, R. *Land Tenure and Agricultural Development in Zaire, 1895-1961*, Wisconsin University Press, 1974, p.2.
9. Jewsiewicki, B. 'Zaire Enters the World System: Its Colonial Incorporation as the Belgian Congo, 1885-1960', in G. Gran (ed.) *Zaire, The Political Economy of Underdevelopment*, Praeger, New York, 1983, p.112.
10. Oliver, R. 'Survival in the Rainforest', *Times Literary Supplement*, 22 Feb, 1991.
11. Harms, op. cit. 8, p.11.
12. Jewsiewicki, op. cit. 9, p.97.
13. Harms, op. cit. 8, p.13.
14. Northrup, D. *Beyond the Bend in Africa: African Labor in Eastern Zaire, 1865-1940*, Ohio University Press, 1988, p.44.
15. Jewsiewicki, op. cit. 9, p.119.
16. TFAP *Plan d'Action Forestier Tropical: République du Zaire*, 1990, Vol. 2, pp.123-124.
17. Kenrick, J. *Deforestation and the Forest Peoples of Central Africa*, report produced for the Institute for Ecology and Action Anthropology (Infoc), Mönchengladbach, Germany, and for Rainforest Action Network, 1990.
18. Grantham, R. *Report on Preliminary Efforts to Form an NGO Rainforest Network in Africa*, African NGOs Environment Network, Nairobi, 1990.
19. Fairhead, J. *Food Security in North and South Kivu (Zaire)*, ZAK 630, Oxfam, 1989, p.3.
20. *Ibid.*, p.7.
21. *Ibid.*
22. Peterson, R. 'Searching for Life on Zaire's Ituri Forest Frontier' *Cultural Survival Quarterly* 14, 4, 1990, p.58.
23. *World Rivers Review* 6, 5, Sept./Oct. 1991, p.8.
24. Fairhead, op. cit. 19, p.19.
25. *Ibid.* p.3.
26. MacGaffey, J. 'Fending for Yourself: The Organization of the Second Economy in Zaire', in Nzongola-Ntalaja (ed.) *The Crisis in Zaire: Myths and Realities*, Africa World Press, New Jersey, 1986.
27. Peterson, R. *Spontaneous Immigration and Colonization in the Ituri Forest*, New York Zoological Society, 1989, pp.1-2. p.58-60.
28. *Ibid.*, p.60.



Patrick Sutherland

Agrochemical corporations have built up powerful and extremely effective lobbying organizations to promote their interests. It has been said (only half jokingly) that ICI — Britain's largest manufacturer of agrochemicals — has received cabinet papers before some cabinet ministers.

The Politics of Industrial Agriculture

by

Tracey Clunies-Ross and Nicholas Hildyard

Mainstream agronomists and policy-makers are increasingly unable to avoid discussion of the social impacts and environmental destructiveness of industrial agriculture. Yet the changes proposed by those who have benefited from the industrialization of agriculture will only strengthen the status quo, and will fail to solve the problems they claim to address. The search for a meaningful solution needs to go beyond debates on the technologies that might make for a more "sustainable agriculture", and confront the political and economic forces that have driven farmers into their present disastrous cul-de-sac.

Farmers do not operate in a political or economic vacuum: nor do the retailers and food processors who buy their food and market it to the consumer. The pattern of land ownership, the size of farms and how they are managed; the choice of crops grown, who grows them and how; the role of workers, their pay and conditions; the means by which foodstuffs are

processed and marketed, at what cost to their quality and for whose profit; the impact of agriculture on the environment; the prices charged to the consumer; who gains and who loses from the current system; and, ultimately, who enjoys economic and political power; these are all factors shaped by the wider political economy in which agriculture operates.

It is this set of external influences which has shaped the direction that agriculture has taken over the past half century or more. Farmers throughout the

Western world have been deliberately encouraged — in many cases, forced — into intensifying their operations. Examples from around the industrialized world illustrate that despite different government policies, types of agriculture, climates and soils, the same pressure to intensify emerges time and again.

The UK: Forced Intensification

In the late 1930s, with war looming, and

Dr Tracey Clunies-Ross is on the staff of The Ecologist. She is working on agriculture, trade and biotechnology issues.

Britain dependent on imports for 60 per cent of its food, the British government set out to increase output by intensifying agriculture. Initially, subsidies were offered for fertilizers and for bringing new land under the plough. During the War, food production targets were set for each county and further subsidies were introduced to encourage farmers to improve drainage and to adopt chemical controls on pests and diseases.

After 1945, the drive for increased production continued. A programme designed to raise net agricultural output by 20 per cent over the next five years was announced in 1947. The range of subsidies was extended to cover fuel, drainage and the removal of hedgerows; farmers were encouraged to borrow to pay for expensive machinery; and a huge research programme into high input/high output systems was funded.

The Agriculture Act of 1947 required farmers to comply with "rules of good husbandry", which were often interpreted as practices which maximized output from the land. Failure to do this could lead to a supervision order and ultimately to a notice to quit. By the time these provisions were repealed in 1958, 5,000 farmers had been placed under supervision orders and 400 had been dispossessed.

In the 1957 Agriculture Act, a new dimension was added to the cost-price squeeze. The Act laid down that annual price awards need not reimburse farmers

for rises in their production costs. Instead, these increases should be absorbed through greater efficiency. In other words, farmers who did not succeed in increasing their output each and every year could expect their incomes to decline.

Common Agricultural Policy

Britain's entry into the EEC and its subsequent participation in the Common Agricultural Policy did little to reverse the trend towards intensification. Drawn up at a time of relative food scarcity, the objectives of the CAP were to increase agricultural productivity and so to ensure a fair standard of living for the agricultural community while providing plentiful food at reasonable prices. To achieve these objectives, the EEC set up a system of paying farmers a guaranteed price for commodities which could not be absorbed by the market.

Despite the intention under the CAP to provide support for farmers in marginal areas, the mechanisms chosen — particularly price support — were linked to volume of output and therefore benefited large and intensive farmers disproportionately. The more that a farmer produced, regardless of market conditions, the more money he or she received from the taxpayer, resulting in growing stocks of surplus food. Now, as the EC attempts to solve its agricultural surplus problems

by lowering guaranteed prices to farmers, it is small farmers, farmers in marginal areas and those who are highly indebted that are being worst affected.

The US: Farming for Benefits

In the US, subsidies and other incentives have also been the main mechanism used to encourage farmers to adopt chemical inputs and to mechanize their farms. As a 1989 report by the National Academy of Sciences notes:

"In more than half a century of operation, government policy has not only affected commodity prices and the level of output, but it has also shaped technological change, encouraged uneconomical capital investments in machinery and facilities, inflated the value of land, subsidized crop production practices that have led to resource degradation such as soil erosion and surface and groundwater pollution, expanded the interstate highway system, contributed to the demise of the railway systems, financed irrigation projects, and promoted farm commodity exports."

The NAS study shows how much US farmland is now managed "to maximize future eligibility for farm program benefits" and tax allowances rather than to ensure good husbandry. The result has been "heavier use of fertilizers, pesti-

Spain: How the EC is Destroying the Traditional Farmer

Unlike in Britain and the US, the protection provided by Spain for its traditional producers meant that Spanish farmers were not forced onto the chemical treadmill until quite recently. But EC funds are now being used to promote large scale infrastructure projects and agricultural intensification. In the face of competition from intensive agriculture in other European countries, Spain's farming population is being forced off the land, its rural communities are disintegrating and the environment is under threat.

In northern Spain, where family farms have long concentrated on dairy products and extensively-reared, high quality meats, farmers are now finding themselves unable to compete with imported produce from intensive farms in Holland.

Similarly, in the grain-producing central region, Spanish farmers have difficulty in competing with production from other European countries. In Mediterranean Spain, where olive oil and wine have traditionally been produced, incentives are now being provided to abandon or uproot the old trees and vines.

Old varieties of apples are no longer available in markets because the trees are being replaced with French varieties that provide a uniform crop and can be kept in central distributor fridges for much longer; the dairy farmer can no longer sell fresh milk directly, because of new sanitary provisions. In Spain, as elsewhere, the only way for farmers to survive is to abandon traditional techniques, to expand and to intensify.

The problem is exemplified by the development of Extremadura, a sparsely populated region on the Portuguese

border. Here, the agricultural programme of the EC-funded National Plan for Regional Development aims to intensify and mechanize farming methods, in order to create jobs in rural areas. Yet, no funding is provided for traditional extensive farming, nor for conservation of local breeds or traditional practices. Instead, investment is allocated for road infrastructure, large scale irrigation works and land amalgamation schemes which tend to undermine, rather than improve, the economic and environmental framework within which local communities have to operate.

The information for this box was provided by Isabel Bermejo of Coordinadora de Organizaciones de Defensa Ambiental (CODA).

cides and irrigation than can be justified by market forces in any given year"; "the inefficient, potentially damaging use of inputs"; and a "surplus production of the same crops that the commodity programs are in part designed to control . . ."

In recent years, the US, like the EC, has attempted to curb the production of surpluses by manipulating the prices paid to farmers. While Reagan was in office, agricultural prices were cut by an average of 40 per cent. During this period, US farmers were going out of business at the rate of one every eight minutes.

Caught on the Treadmill

As farmers intensify they become more and more dependent on inputs purchased on the open market. The loss of control over their inputs would be of less importance if farmers were able to move in and out of chemical agriculture as they chose. But the disruption caused to agroecosystems by pesticides and artificial fertilizers is such that farmers quickly become locked into a cycle of increasing susceptibility to pest infestations, declining soil fertility and diminishing returns on inputs. Unless farmers have the financial means to wean the land off chemicals and restore the natural processes that ensure fertility and keep pests in check, they have little option but to remain on the "chemical treadmill".

The agrochemical industry has been assiduous in cultivating farmers' dependency on their products. Whereas the agrochemical companies originally concentrated on supplying fertilizers and pesticides, they now increasingly dominate the seed industry. Following the example of large millers and grain traders, such as Rank Hovis McDougal, multinational pharmaceutical and petrochemical companies have moved to buy — or otherwise control — nearly 1000 once-independent seed companies. By the late 1980s, Shell, ICI and Ciba-Geigy were among the ten largest international seed houses. In the Netherlands, three companies control 70 per cent of the agricultural seed market, and four companies 90 per cent of the market for horticultural seeds. Transnational seed houses now control about a quarter of seed sales in the North, and 5-10 per cent of sales in the Third World.

The strategy of selling inputs as a package has been pursued extremely successfully. In the 1980s, Shell distributed

free booklets with its seed varieties, indicating the optimum timing for the application of growth regulators, fertilizers and pesticides. Dalgety-Spillars, a major force in breeding peas and beans, offered direct advice on all aspects of dried pea production, including fertilizer and pesticide treatment.

Since the early 1970s, seed varieties developed by companies have been patentable, making it illegal for farmers to trade in such seeds. Because of the prob-



Wheat fields in northern France. Long term policy in France is to amalgamate farms into larger, more "modern", units. Under the process of remembrement, officials can force farmers to exchange small plots of land with those who have adjacent property, or who would farm the land more intensively. Over 12 million hectares have been traded in this manner.

Nigel Cattlin/Holt Studios International

lems of enforcing this, however, seeds are increasingly developed so that they do not breed true, and the farmer is forced to go back to the seed company for next year's crop. As more farmers are persuaded to change to new seed varieties, traditional ones disappear, reducing the genetic base of agriculture and increasing the vulnerability of crops to pests and diseases.

Within the EC, the loss of varieties is further encouraged by laws which make it illegal to sell varieties which are not "listed and approved" — the seeds falling into the non-approved category being almost exclusively traditional, non-patented varieties. In effect, the law gives corporations a monopoly over the supply of seeds by outlawing the use of those seeds that they do not control. With the advent of biotechnology, the control exercised by corporations over the farmer will be strengthened yet further (see Richard Hindmarsh, 'The Flawed "Sustainable" Promise of Genetic Engineering', *The Ecologist*, Vol. 21, No. 5, 1991).

Land Concentration

Rising production costs (in Britain, pesticides cost farmers some £450 million a year, more than ten times the outlay in the early 1970s) have forced farmers to increase output, both by intensifying production and by increasing the size of their holdings. A British dairy farmer in the 1950s could earn a living with 15 cows: by the 1980s, to have the same income in real terms, a farmer needed 75 dairy cows.

The result has been an increasing concentration of land ownership. Between 1953 and 1981, the number of farms in Britain fell from 454,000 to 242,300. In the US, the average farm size increased from 175 acres in the 1940s to 429 acres in the early 1980s. Now, just one-tenth of one per cent of the population — approximately 240,000 people — own half of the country's productive land, with a third of all output being produced on a small number of "superfarms". The 400 largest farms in the US produce more than all those in Iowa, Illinois and Florida combined.

At a time when good returns could be gained from farming in Britain, competition for land led to rising land prices, with farmers borrowing against the value of their land to increase their holdings and to finance further intensification. As farmgate prices have fallen back, land values have not held up and many farmers (36 per cent in England and Wales) now find they have borrowed more than the present capital value of their farms. By 1991, the main British banks had lent £10

billion to the agricultural sector and an estimated 70 per cent of net farm income was going to service this debt. Many farmers have thus been forced out of business, their holdings bought up at "distressed prices", by other farmers, corporations or absentee investors. In the US, large corporations including Dow Chemical, Monsanto, Union Carbide, Goodyear and Coca-Cola, have invested heavily in land.

Corporate Control of the Food Industry

The US trend towards corporate ownership of land is paralleled by increasing corporate control of food retailing and processing. In 1986, over half of all food sales in Germany, the Netherlands, the UK and Belgium were controlled by the five biggest national retailers.

Increasingly, corporations are seeking to control food production "from seedling to supermarket". In Britain, supermarket chains such as Sainsbury already control each stage in the production of meat for their stores, from the animal feed through to the slaughterhouse, through a

series of commercial ties with other companies. Similarly, Dalgety and Unilever — two of the top five food manufacturing companies — now control 45 per cent of animal feedstuff sales, and both have interests in the seeds sector. Hillsdown Holdings, a major producer of red meat, bacon, poultry and eggs, has 150 subsidiaries and a turnover in 1987 of over £3 billion. It supplies its own feed to its poultry concerns from its own mills, and its own chicks from commercial hatcheries.

In Britain, corporations have tended not to get involved in land ownership, but outright ownership of land or livestock units is by no means a pre-condition for controlling production. "Contract farming", in which farmers sell exclusively to one retailing company, achieves the same ends without the need to invest in land or stock. Products grown under contract have to be produced to the right specifications at the right time. Farmers are effectively transformed into outworkers for corporations over which they have no control.

Around half of Britain's poultry, eggs, pork and bacon, and over 90 per cent of its peas and beans, are grown to the order and specification of the food industry. In

the US, it is estimated that a third of farmers will produce under contract by the end of the century. In certain sectors, the figure is much higher: by 1980, 95 per cent of all broilers in the US were being produced under contract.

Because of their enormous buying power, large corporations can drive down the prices paid to farmers, and a decreasing proportion of the total spent on food reaches the producers. Whilst food prices to consumers have remained more or less steady in real terms, farm incomes, particularly in the livestock sector, have declined substantially. In the US, the amount received at the farm for produce sold in shops declined by six per cent in real terms from 1980 to 1987, with farmers receiving about \$90 billion of the \$380 billion spent on food each year.

The increasing corporate control of food production — from growing, through marketing to retailing — has a dynamic that is self-reinforcing. In order to stay solvent, farmers must expand their businesses and produce a greater volume of food. Large volumes of food can most reliably be sold through the multiples, as although this usually brings a lower price, marketing and storage costs are reduced.

EcoBase

The Key to the Environment

Have you ever wanted a really up to date database of addresses of environmental organisations? Now you can have one without having to create your own.

- EcoBase**
- * compiled by experts and easy to use
 - * contains details of over 6,100 organisations in UK and Ireland, plus over 800 cross references
 - * lists postal addresses, phone and fax numbers of national, regional and local organisations
 - * includes details of businesses, statutory bodies and voluntary organisations
 - * covers all aspects of environmental/green issues
 - * over 200 categories and 77 locations to help identify precisely the address(es) you require
 - * requires IBM compatible computer and hard disk

NOW AVAILABLE as a **Directory on Disk** complete with a runtime copy of Folio VIEWS software, with hypertext links, enabling rapid searching and location of addresses, at ONLY £40 plus VAT. **Directory on Disk** is FAST - very FAST! 3.5" or 5.25" versions available.

Try before you buy? Send SAE marked 'EcoBase' for further details to the address below.

To order **Directory on Disk** with Folio VIEWS software send cheque for £47 (specifying 3.5" or 5.25" version) to

P S Berry, Environmental Consultant (E1)
Pwlllyfan, Llansadwrn, Llanwrda, Dyfed SA19 8LS
Tel: 0550-777782 Fax: 0550-777782

EcoBase is one of a series of databases published by Keystroke Knowledge

All Keystroke Knowledge products, including **EcoBase**, are also available as complete databases with specialist software for selecting addresses, printing labels and outputting to files - ideal for direct mail; selected addresses on labels for direct mailing; selected data as listings; selected addresses on floppy disks as data files to use with existing word processing, mailmerge or database software. Details on request.

Smaller wholesalers and retailers, who have to pay more for their supplies, are driven out of business, denying farmers alternative outlets.

Sources of Power

Large farmers, the agrochemical industry and the food industry constitute the major power blocks in agriculture today, dominating policy to the point where what is deemed "good" for their interests is — in many circles — deemed to be synonymous with what is "good" for agriculture and food production in general.

Agrochemical companies have now established themselves as a major source of advice for farmers, complementing and strengthening their role as suppliers of inputs. In 1984, a survey carried out for *Farmers Weekly* found that although the British government's Agricultural Development and Advisory Service (ADAS) was well respected, "merchants' reps are more likely to be used for advice on day-to-day and other matters because they are often on farms anyway whereas the ADAS man would have to be called out." The survey further revealed that the single most important subject on which advice was sought was the use of agrochemicals. Yet those turning to ADAS for information would have been likely to have been given similar advice. Despite growing interest from farmers in the organic approach, it was not until 1988 that ADAS appointed an organic coordinator and a team of regional advisors.

The agrochemical companies' powerful hold over decision-making at the farm level is reinforced through the advertisements they place in the farming press and in trade magazines, many of which are delivered free to farmers. In addition, the reliance of many farm magazines on advertising revenue from agrochemical corporations means that they are generally unwilling to bite the hand that feeds them. There have been cases of companies withdrawing advertisements as a result of articles which were even mildly critical of pesticides — even pesticides produced by other companies.

Control of Research

There are few agricultural institutions in either the US or Europe which do not now rely to some extent on industry funding for their activities. With funding comes

Through the strategic placing of grants, industry can direct public funds into research that best serves its own long term agenda.

industry control over the specific content of research projects and the power to suppress research that might rock the agro-industry boat. As Henk Hobbelink of Genetic Resources Action International notes of biotechnology funding:

"Monsanto has 'donated' \$23.5 million to Washington University for biotech research: Bayer is contributing to the Max Planck Institute in Cologne for the same purpose; and Hoechst built an entire \$70 million biotech research laboratory for the Massachusetts General Hospital where research on crop genetics is also carried out . . . These industry-university contracts have caused much controversy for obvious reasons. 'You don't need to know algebra to figure out how that committee works', says US senator Albert Gore, talking about the committee that governs the Monsanto/Washington University deal. 'No research can be done unless the company gives permission.' Of the Hoechst grant for a biotech laboratory, [one researcher has commented] 'Essentially everyone in that lab is an indentured servant to Hoechst.' In most contracts, the TNC has the right to the first look at the results and can delay publication of them until patent possibilities are investigated."

Although direct corporate grants generally constitute a small proportion of total research budgets, they are an important source of power within research departments. Corporate funding brings financial security to a project and enhances the status of the researcher within the department. By a perverse logic, the capacity to "bring in" corporate funds becomes a route to promotion — with the result that key administrative posts within universities and research institutes have come to be dominated by those who share industry's priorities.

Corporate grants give researchers leverage to gain additional funds from government and even small amounts of

corporate funding can therefore have a disproportionate influence on public research. Through the strategic placing of grants, industry can direct public funds into research that best serves its own long term agenda. The process has gained its own momentum, and universities are embracing their own corporatist, profit-maximizing vision. In the US, public universities allocate scarce resources to basic research which it is hoped will yield patentable processes and products to form part of the universities' future endowment. Biotech research thus receives considerable funds, while research on ecology and natural resource management, which would bring broader social and environmental benefits, is neglected or eliminated.

Dominating Committees

With both research and training dominated by the industrial approach to agriculture, industry is able to operate in a climate that is broadly sympathetic to its aims and views. Those trained or employed in the mainstream can move freely between public and private sectors, universities and government. The result is a hand-in-glove relationship between the industry and its supposed regulators.

That "revolving door" relationship between industry and the wider agricultural and academic community is most conspicuous in the committees which decide on agricultural policy. In the Netherlands, over a third of the seats on the committee which decides on research funding for biotechnology have been assigned to commercial companies. Before 1985, pesticides in Britain were "regulated" through the Pesticide Safety Precaution Scheme, a "gentlemen's" agreement between the agrochemical industry and government, which would still be in place now had the EC not forced the UK to replace it with statutory controls. Whilst the civil service and the industry were well represented on the PSPS advisory committee, consumer groups, environmentalists and farm workers had little or no representation. The industry itself provided the data for assessing the pesticides. The bias of the system can be gauged from the decisions taken. By the mid-1980s, 41 pesticides on sale in the UK were banned or severely restricted in other countries. At the international level, industry's influence on such bodies as the FAO/WHO Codex Alimentarius Com-

The SAFE Alliance

Over 20 UK farming, consumer, organic, animal welfare, environmental and Third World groups have formed the Sustainable Agriculture, Food and Environment (SAFE) Alliance.

According to SAFE's campaign statement:

"Agriculture is about more than simply producing food. It is a way of life and makes a vital contribution to the health of rural communities. The central objectives of a sound agricultural policy should be:

- An agriculture that is supportive of rural communities, that halts the decline in full-time farm employment and provides a stable livelihood for farmers and farm workers;
- An agriculture that does not jeopardize the health of those who work or live on the land or the consumer through the use of polluting or toxic production methods;
- An agriculture that is capable of flexible response to national food and nutrition goals designed to improve public health;
- An agriculture that produces affordable food, of high nutritional quality and that minimizes chemical and microbiological contaminants;
- An agriculture that does not lead to the reduction of soil fertility, that minimizes reliance on non-renewable resources and that is sustainable;
- An agriculture that both conserves and enhances the

countryside, not only in its visual aspect but also in terms of its resources and wildlife;

- An agriculture that respects the welfare needs of farm animals;
- An agriculture that does not threaten

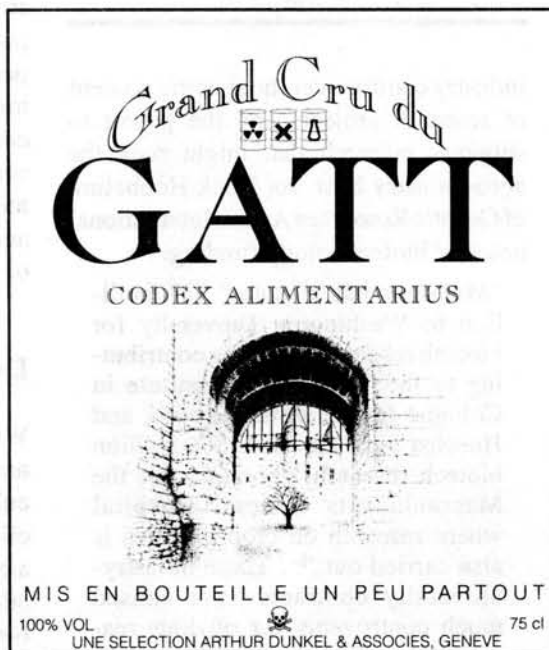
the development and maintenance of food security and sustainable agriculture in other countries, especially those in the Third World."

More specifically, SAFE seeks to switch farm subsidies away from price support towards payments for sustainable and environmentally enhancing farm management practices agreed on a whole farm basis. All the land on any one farm would be included in the scheme, and payments made would be tiered on an acreage basis. The effect of these whole farm management agreements, argues SAFE, would be "to put smaller family farms (the mainstay of many rural communities) back on a level playing-field with much larger farms, and to remove the present in-built bias towards increased farm size."

Such agreements, argues SAFE, would both encourage participating farmers to modify their production methods to take full account of environmental factors, and also reward those, such as organic farmers, already practicing environmentally-sensitive methods.

SAFE Alliance, 21 Tower Street, London WC2H 9NS.

L'Alliance, 24, rue de l'Ermitage, 75020 Paris.



In France, an alliance of consumers, ecologists and small farmers has been formed to lobby on a similar platform to that of SAFE. The initial focus of L'Alliance has been the GATT proposals which will seriously effect French small farmers and food quality. Bottles of the Grand Cru du GATT ("un vin produit n'importe où, produit n'importe comment pour n'importe qui") have been presented to French deputies and to the GATT delegates in Geneva.

mission (see Mark Ritchie, 'GATT, Agriculture and the Environment', *The Ecologist*, Vol. 20, No. 6, 1990) is also considerable.

Movements for Change

Despite the pressure from governments, corporations, international bodies and consumers, there are farmers and growers who have defied conventional wisdom and resisted the pressures to adopt intensive chemical farming. Over the years, they have built upon existing approaches for controlling pests and enhancing fertility without the use of synthetic chemicals and have developed new ones. They

have created their own marketing networks and have attempted to evolve an agriculture that, in the words of Wendell Berry, "depletes neither the soil nor people."

Since the early 1980s, a succession of reports (some official, some emanating from universities) have confirmed what "alternative" farmers already knew; that the agriculture which they practise is not only ecologically benign but capable of being economically attractive. As a 1980 report by the US Department of Agriculture (published but never implemented) concludes: "Contrary to popular belief, most organic farmers have not regressed to agriculture as it was practised in the 1930s . . . Most of the farmers with

established organic systems reported that crop yields on a per-acre basis were comparable to those obtained on nearby chemical-intensive farms."

More recently, the US National Academy of Sciences came to a similar conclusion: "Farmers who adopt alternative farming systems often have productive and profitable operations, even though these farms usually function with relatively little help from commodity support programmes or extension."

Many seek to go further than farming in a more ecologically sensitive way, their aim being to achieve wider change within society. Advocates of permaculture systems, for example, have become as concerned about the design of cities, the use

of water and energy, the exploitation of forests and the production of "wastes", as they have about the design of sustainable agricultural systems.

Community Supported Agriculture

Still other groups are attempting to develop more direct links between farmers and consumers and thus regain control over the marketing of food. One radical approach is being developed by the community supported agriculture movement, where instead of food production being the preoccupation of the farmer alone, the community (or a specific group of people from one local area) agrees to share the risks and responsibilities. In most instances, a detailed budget for the farm is drawn up on an annual basis, which includes wages for those working on the land, and then the costs are shared by the community which the farm will support. Often this is done on the basis of pledges made at a meeting at the beginning of the season, the amount pledged varying according to the ability to pay. One of the advantages for farmers of this system is that they start receiving payment as soon as the crops are planted, rather than having to wait until crops are harvested. Should a crop fail, the community, rather than the individual farmer, would bear the loss.

Because farmers know that their income is guaranteed, and are growing produce for people and not for the market, they tend to grow a much wider variety of foodstuffs, and aim to provide what people want, instead of concentrating on the crops that give the highest returns. This diversity within the farm encourages the kind of integrated cropping practices which make crop failures less likely. The active participation of shareholders in farm work is encouraged, a principle aim of the movement being to "reconnect" those whose primary activities lie outside farming. This community involvement means that other related issues — such as land ownership, conservation, recycling and the use of natural resources — are considered and discussed.

Forms of community supported agriculture have been in existence in Switzerland for over 25 years, and are also to be found in Germany. In North America, community farms have been developing since 1985, with around 80 in existence in 1990, and nearly 150 by 1991. Trauger

Groh, one of the pioneers of the movement in the US, has outlined some of the important aspects of community supported farms in his book *Farms of Tomorrow*:

"Some things are typical for all community supported farms. In all of them there is a strong dedication to quality; most of them are organic or biodynamic farms, most of them show great diversification, most are integrated farm organisms having their own livestock and thus their own source of manure, or they are aiming in this direction. At all of them, far more people are working regularly per 100 acres than in conventionally run farms; and generally there are just many more people around participating in all of the dimensions of agricultural life: working, relaxing, storing, shopping, celebrating. This human element is of enormous importance. It shows that these farms have something to offer beyond good food. They embody educational and cultural elements that draw the interest of many people."

In Japan, numerous similar initiatives have been developed since the 1960s, and there are now a variety of groups, all aiming to reconnect farmers with consumers, and encourage production of good quality food. The biggest of these groups, the Seikatsu club, has over 150,000 members, and operates as a form of buyers' co-op.

New Paths

The diversity of initiatives being developed shows that although a growing number of people are determined to find ways of producing and distributing good quality, healthy food in ways that are less environmentally, economically, and socially destructive, there is no "off-the-shelf" blueprint for realizing the promise which the alternatives hold out. On the contrary, differing histories, environments, social conditions and political structures demand a diversity of responses if real change is to be achieved. Problems ranging from environmental degradation to concentration in the food industry are interlinked, and cannot be addressed either on a single issue basis or through universal solutions. Indeed, unless groups are aware of the need for a deeper restructuring of industrial society, they may end up legitimizing the very processes and interests they are seeking to change.

At issue is the question of power — of who controls the land, inputs, production, marketing, research, decision-making and policy, and with what aims and priorities in mind. In that respect, what unites these groups, from farmers to environmentalists, from consumers to animal welfare campaigners, is not an identical vision of the future, but the desire to regain an element of control.

In order to campaign for changes of a structural nature, it is vital that groups should form alliances which cut across narrow sectoral boundaries, and fight campaigns on a broader front (for examples in the UK and France, see Box). In forming such alliances, differences between groups do not magically disappear: the amount of weighting to be given to environmental protection, animal welfare, food quality, price, the protection of local communities, and so on, will always be a matter for negotiation. Those that have begun to form such alliances, however, have come to recognize that though the differences should not be underplayed, they are of less importance than the common commitment to change — and that emphasizing them only plays into the hands of those wielding power.

This article is a shortened and edited version of a report to be published by *The Ecologist* in March as part of its *Whose Common Future?* project. The fully-referenced report costs £9 to individuals and £16.50 to institutions (including p&p).

Selected Bibliography

- Belden, J.N. *Dirt Rich, Dirt Poor: America's Food and Farm Crisis*, Routledge and Kegan Paul, London and New York, 1986.
- Body, R. *Our Food, Our Land*, Rider, London, 1991.
- Erlichman, J. *Gluttons for Punishment*, Penguin, Harmondsworth, 1986.
- Fowler, C. and Mooney, P. *Shattering: Food, Politics and the Loss of Genetic Diversity*, University of Arizona Press, Tucson, 1990.
- Groh, T.M., and McFadden, S.H. *Farms of Tomorrow: Community Supported Farms, Farm Supported Communities*, Bio-Dynamic Farming and Gardening Association, Kimberton, 1990.
- Hobbelink, H. *Biotechnology and the Future of World Agriculture*, Zed, London, 1991.
- Jackson, W., Berry, W. and Colman, B. (eds.) *Meeting the Expectations of the Land: Essays in Sustainable Agriculture and Stewardship*, North Point Press, San Francisco, 1984.
- Lowe, P., et al. *Countryside Conflicts: The Politics of Farming, Forestry and Conservation*, Temple Smith/Gower, Aldershot, 1986.
- National Research Council, *Alternative Agriculture*, National Academy Press, Washington, DC, 1989.
- Strange, M. *Family Farming: A New Economic Vision*, University of Nebraska Press, Lincoln and Institute for Food and Development Policy, San Francisco, 1988.

Burma's Forests Fall Victim to War

The Burmese military dictatorship badly needs funds to finance its war against the democratic resistance movement. In addition to receiving grants from UN agencies, it has sold mineral exploration rights to Western companies and extensive logging concessions to Thailand. In 1991, Rob Harbinson travelled to Manerplaw, the democratic headquarters on the Thai border, and witnessed the environmental destruction that has resulted. At the time of going to press, government forces were reported to have advanced to within ten kilometres of Manerplaw.

For over three years Burma has been in a state of civil war. In September 1988, student demonstrations in Rangoon, protesting against the ageing dictator Ne Win, and demanding a democratic government, were viciously crushed by the military. Over 1000 people were shot on the streets and many more perished in the ensuing nationwide clampdown. As a result, Ne Win stepped behind the scenes and handed nominal power over to the State Law and Order Restoration Council (SLORC), led by General Saw Muang.

In May 1989, to placate both local and international opinion, the SLORC agreed to hold a general election. The result was a major coup for the opposition: the National League for Democracy (NLD), led by Aung San Suu Kyi, swept to victory with an 80 per cent majority. The SLORC reacted by detaining, torturing or murdering over 60 democracy leaders. Eight of the leaders, however, escaped to Manerplaw, the headquarters of the Karen National Union (KNU) tribal resistance movement, where they set up the National Coalition Government of the Union of Burma.

In order to root out this opposition, the regime has had to modernize and expand its armed forces. In August 1990, the SLORC received the first delivery of a \$1.4 billion arms deal made with China. It appears that most of the arms were supplied on credit, pending the exploitation of oil concessions awarded in 1989. Ten companies — Croft Exploration, Premier Oil and Kirkland Resources from Britain; Unocal and Amoco from the US; Idemitsu (Japan); Yukong Ltd. (South Korea); BHP Australia; Petro-Canada; and Shell — paid the Burmese government large sums of money for exploration rights. The regime also appears to have paid for the arms with cash earned from the opium trade, and from logging concessions granted to China and Thailand.

The Karen are the largest of many tribal groups who inhabit the densely forested mountain regions of Burma's periphery.

For many years they fought for the independent state that was promised them by the British, but have recently changed their focus from separatism to national democratic federalism. Their leaders now stress that they have abandoned the inter-tribal fighting which has long been prevalent in north-east Burma, where several armies vie for control of the lucrative opium trade.

The SLORC is keen to aggravate these rivalries amongst the opposition. They control their own narcotics warlords, notably Lo Hsing-han, who has been negotiating with other groups on the SLORC's behalf. The deal offered to tribes is simple: a cease-fire with the SLORC or be crushed by their new superior fire power. In return, the SLORC offers logging concessions, trafficking routes and encourages opium cultivation on the cleared land. This policy has met with some success: the Kopang, the Pa-o and the Wa tribes have all submitted to a cease-fire on these terms.

UNDP Support for SLORC

Although the SLORC has been widely criticized for its involvement with the opium trade, in July 1991 the United Nations Development Programme (UNDP) gave them \$1.3 million, the latest instalment of a \$17.5 million grant for "Border Area Development" and opium replacement. A further \$680,000 has been promised for unspecified environmental projects. Local resistance leaders are under no illusion as to the threat this poses. Thrush spray aircraft and 2,4-D herbicide have already been supplied by the US for opium eradication, but have been used to spray villagers as well.

Most of the UNDP grant is destined for road building, though there has been no consultation with the tribal occupants of the land. Apart from a few logging tracks, there are only footpaths in the area, and this inaccessibility is a valuable defence for the democratic forces. Since the government offensives started in 1983, the military have

had to withdraw before every monsoon, allowing a valuable breathing space for the Karen and their allies. Roads into the hills would allow the transport of heavy weapons into tribal areas.

Though dominated by the Karen army, Manerplaw has become much more than a military stronghold. There are now 21 different groups based here, who share the common aim of opposing the SLORC and are united under the Democratic Alliance of Burma. In May 1990, a federal university was inaugurated, where 53 students from ten different ethnic groups are now learning leadership skills. There are also two environmental groups, Green November 32 and the Environment and Culture Association of Burma. Both are committed to raising environmental awareness amongst the tribal people and are also involved in advising environment minister Bo Hla Tint in the difficult task of formulating an environment policy.

The Karen have traditionally practised a sustainable method of slash-and-burn agriculture. When clearing an area they are careful to leave some mature seeding trees and fire breaks around the perimeter and after use they leave it fallow for ten to twenty years. Their logging practices are aimed to minimize ecological damage. Mature trees are ring-barked and left to die and season for up to three years. By this time the leaves and small branches have been shed, and so the felling does little damage to the surrounding stand. Extraction is done by elephants, which are less harmful to the forest than machines.

Unfortunately, the war is putting pressure on the Karen to abandon these traditional systems. The KNLA used to derive much of their income from levies on cross-border trade, but only three out of their twelve border posts survived the SLORC offensive of 1989-1990. They have therefore had to turn almost exclusively to intensive logging in order to fund the war effort, even though it will ultimately destroy their forest cover. Taxes are collected from the Thai

companies logging their forests. Along the Salween river there are saw mills at regular intervals, many of them run by Karen officers using machinery owned by Thai companies.

Deals with Thailand

Most of the logging, however, is controlled by the SLORC regime. The logging ban imposed in Thailand in 1988 left a large furniture trade and a booming construction industry starved of resources. The ailing Burmese regime was happy to give bargain prices on logs to be cut at 49 concessions by 29 Thai companies, including Chao Phraya Irrawaddy, who have backing from Asahi of Japan. In 1989, two million acres of teak forest in the tribal border areas were conceded to Thailand. Depriving the insurgents of forest cover and opening up the area to a military advance, are strategic advantages which were certainly considered by SLORC when these deals were arranged.

The war means that policing the Thai logging is impossible. The companies have limited three-year concessions, and are aware that the political situation may not stay in their favour for long. The aim is high-volume extraction, rather than sustainable forestry. The Burmese government has unrealistically set five feet as the minimum

diameter of teak to be felled, but I did not see a single log of five feet diameter at any of the Thai camps and logs under twelve inches were commonplace. In a logged concession I visited in Saw Tha district, the only trees left standing over one foot in diameter were in Karen villages.

The local people complain that the rains now arrive up to two months late. When it does come, the rainfall is the highest in the region — 4,800mm annually, compared with 1,500mm in Bangkok. It causes severe erosion along the steep banks of the Salween river wherever there has been logging or road-building. The floods of August 1991, which made 210,000 people homeless, were attributed at least in part to deforestation.

International Indifference

The response of the international community to Burma's plight has been faint-hearted and slow. In February 1991, a delegation from the National Coalition Government visited six countries in Europe. I asked the foreign affairs spokesman for the KNU, Dr Em Marta, what the European response was to the question of granting diplomatic recognition to the democratically-elected government. "They listened," he replied.

Condemnation of the SLORC for human

rights abuses and the repression of democracy has come from the US, the EC, Australia and Canada, yet all these countries import Burmese timber. At meetings in June and July 1991, the EC and US attempted to get the cooperation of the six ASEAN countries in putting pressure on Burma. ASEAN declined, saying that it would continue "constructive engagement" with Burma. In November, the Thai agriculture minister visited Burma to renegotiate logging concessions, since many of the original concessions had already been logged out.

Despite its blatantly oppressive nature, the SLORC has largely escaped world attention. It has survived on foreign arms and earnings from countries keen to profit from its cheap resources. If the countries of the West are sincere in their pledge to support democracy, then they should recognize that Burma's democratically-elected government is fighting to survive, and should respect its wishes by imposing comprehensive sanctions against the illegal SLORC regime.

Rod Harbinson

Rod Harbinson recently spent 18 months in the rainforests of South-East Asia and Australia. He is currently campaigning with the London Rainforest Action Group, 9 Cazenove Road, London N16 6PA.

HARVARD UNIVERSITY PRESS

Environmental Health

Dade W. Moeller

This book presents an all-encompassing view of our many environments: personal, indoor, outdoor, and worldwide. Dade Moeller emphasizes the interrelations of local, regional, and global events and their short- and long-term effects on the health of humans and other living things. He examines individual aspects of the environment—such as air, water, and food—and links them to issues concerning the development and application of control measures. The book covers a broad spectrum of timely topics, including health hazards in the workplace; pest control; the disposal of wastes; the effects, uses, and management of ionizing and nonionizing radiation; environmental monitoring; risk assessment; natural and man-made disasters; and the impact of energy usage. The result is a well-balanced and unsensationalized perspective on the often complex phenomena that cause environmental health problems.

\$39.95 cloth



NEW IN PAPERBACK

It's a Matter of Survival

Anita Gordon and David Suzuki

"It's a Matter of Survival is the best piece of extended environmental journalism I've seen to date. Few specialists—the 'experts,' myself included—would have tried for this much-needed panoramic view. It is an excellent book." —E.O. Wilson
\$10.95

Sustaining the Earth

The Story of the Environmental Movement—Its Past Efforts and Future Challenges

John Young

"[Young] possesses a keen sense of historical irony...that is matched by a rare ability to reconcile politically divisive false dichotomies." —*Issues in Science and Technology*
\$10.95 paper

Harvard University Press

Cambridge, MA 02138
(617) 495-2480



Grassroots Industrialization

MASTERING THE MACHINE, by Ian Smillie, Intermediate Technology Publications, 103-105, Southampton Row, London, 1991, £14.95, 268pp. ISBN 1-85339-096-8.

TO THE HANDS OF THE POOR, by Robert Chambers, N.C. Saxena, and Tushaar Shah, Oxford and IBH, New Delhi, Rs 30, and Intermediate Technology Publications, London, £7.95, 1991, 273pp. ISBN 81-204-0428-9.

These two books discuss how technology can help the poor, and why the poor are so badly served by development. Their message is one of hope: practical steps can be taken to transform the lives and livelihoods of millions of poor people.

Mastering the Machine is an engaging and fluent book, especially where Smillie tackles his favourite subject, technology in its human and historic context. According to Fritz Schumacher, the founding father of the Intermediate Technology (IT) movement, the way ahead could be straightforward; if the technology was right, everything else would fall into place. Unfortunately, Smillie observes, it is not that easy. The obstacles are many: a lingering preference for prestigious large-scale projects; bureaucratic conservatism and risk-aversion; lack of credit; pressure from donor countries to favour their own exporters; corruption; skill shortages among beneficiaries; the inability of economists and politicians to realize that technology choices matter; and various

social and cultural barriers. A singular combination of understanding, inventiveness and perseverance is therefore needed to make ITs work.

There may also be dangers in success. When labour-saving rice-hulling machinery was introduced in Bangladesh, it soon came to be controlled by men, depriving many rural women of a major source of income. On the other hand, machinery for making fibre-concrete roofing tiles in Africa has created local employment, put cheap, durable roofs on countless homes, and reduced dependency on expensive imports of corrugated iron.

Smillie suggests that intermediate technologies are creating a new industrial revolution. In contrast to the failed mega-projects which litter the South, such as unused nuclear power stations and loss-making hi-tech steel mills, new small scale industries are emerging, created by entrepreneurs with growing skills and access to appropriate technologies. In the truck-repair depot of Suame Magazine in Ghana, for example, the new metal-working tools from the IT Development Group suited the existing skills of the mechanics; the result has been a diversified, light industrial centre that is generating incomes, making profits, reducing foreign exchange outflow and helping the country stand on its feet.

This seems a long way from the commonly-quoted examples of IT, such as fuel efficient stoves. But it is in industrial centres like Suame Magazine that the stoves and other machines are built, and thus where the multiplier effects are greatest. A new generation of intermediate technologists are getting their fingernails dirty: working with entrepreneurs as well as NGOs; viewing industry not as a dirty word, but as the means of production; and welcoming profits, rather than shrinking from them. Whatever IT donors may make of this, the movement has come a long way from the proverbial provision of fishing rods.

Appropriate Forestry

To the Hands of the Poor is far more specialist, looking at the potential of irrigation and forestry to improve the lives of the poor in India. Despite the government's commitment to poverty relief programmes, many of its policies discriminate directly against the poor.

For example, market controls on forest products push down the prices paid to

collectors of most non-timber products, such as seeds, fruits, leaves, flowers and firewood, to under 20 per cent of their value, and divert the profits to officials, contractors and brokers who know how to exploit the system. Controls extend to timber grown and cut on private land — a sure way to prevent people from planting trees. The lifting of such restrictions would unleash a flood of benefits to the poor, for example the opportunity to use trees as a way of investing for the future.

So-called social forestry projects on private and village lands, mostly of eucalyptus monocultures, have completely failed to alleviate poverty, or achieve any of their stated social objectives. But they have been highly successful in providing wood for industry. Meanwhile, the public forests, although they are expressly orientated towards industrial timber production, are failing to deliver either for industry or for the needs of the millions of people who depend upon them.

These two problems can neatly be put together to create a solution: industrial forestry on private land, and public forests managed to maximize yields of non-timber products for the benefit of the poor. Various kinds of cooperative arrangements can be reached, with guaranteed security of tenure and usufruct to forest-dwelling people, and profit sharing between them and the forest department. The main question is whether the forest department is capable of such a transition.

The text of *To the Hands of the Poor* is supplemented by a series of useful tables, which make good sense out of a lot of complex data. Particularly interesting is the "Proportion of Stem Wood and Branches in Trees", since "the stem goes to the rich and the towns, whereas branches and twigs belong to the poor". At one end of the scale eucalyptus is 81 per cent stem, 19 per cent branches and twigs; at the other end of the scale, *Prosopis julifera* yields 30 and 70 percent respectively. So the forest department classifies *Prosopis* as a weed, and tries to eliminate it, and plants eucalyptus. Fortunately they have not succeeded in wiping out *Prosopis* — it grows wild on degraded lands, and has been responsible for solving the fuelwood crisis in some areas. This is the best and most appropriate kind of technology, one which comes free and reproduces itself, oblivious to official discouragement.

There are similar insights concerning irrigation. Groundwater has a huge un-

tapped potential, three times greater than that of the dams and canals favoured by bureaucrats. The poor achieve the greatest benefits from a competitive water market supplied by local entrepreneurs, gaining the opportunity to irrigate their own land, and to find more work on larger farms. By contrast, monopoly State-run pumps offer a poor and erratic service, failing to deliver water when it is most needed, as it is diverted to local bigwigs.

A message that emerges from both books is that the naive approaches of some environmental and development NGOs are not serving anybody very well. For example, many limitations on the movement of forest products in India have been introduced in response to environmental lobbying. Likewise, on the international scene, "income generation" is preferred to profit. Cooperatives and community initiatives are regarded as ideologically sound, while private (usually extended family) enterprise is seen as socially divisive. Of course some community efforts are highly successful, but they are by no means universally replicable. Among the poor, as among the rich, the enterprise of individuals and small groups is often the most dynamic agent of change, and profit and security are often the greatest motivators.

Oliver Tickell

Oliver Tickell is a freelance writer on environmental issues, living in Oxford.

Captain Sensible and Planet Earth

SAVE THE EARTH, edited by Jonathon Porritt, Dorling Kindersley, London, 1991, £14.99 (hb), £12.99 (pb), 208pp. ISBN 08-6318-642-4.

Jonathon Porritt, has assembled contributions for *Save the Earth* from a host of famous and not-so-famous names. Diplomats rub shoulders with scientists, and politicians with pop stars, in a popular front for the defence of the planet. Despite the fact that some of the contributions are repetitive and others devoid of substance, there is a core of great value, not least Porritt's own input, which is first-class.

The book confirms his status as an activist of international stature.

But to swell the ranks of this popular front, recruitment seems to have been aimed at the lowest common denominator of acceptability. Porritt the Activist no doubt knows that the track record of decision-makers at all levels falls far short of what is required; but Porritt the Editor has concluded that too much alarmism is counter-productive. The message of *Save the Earth* is one of hope. Not only is there still time, but action is being taken today to ensure that there will be many tomorrows. Though the dangers are well documented, doom and gloom are cast into the shadows by a radiant optimism. David Attenborough's introduction, for example, is a shining example of how people keep up their spirits by clutching at straws. This will doubtless widen the book's appeal, for there are many who welcome reassurance that something is being done to avoid ecological melt-down.

The price paid is a blurring of the issues. When it comes to describing the sickness, it is easy to agree; diagnosis and prescription are another matter. Although *Save the Earth* describes what it calls a series of "timebombs", it cannot bring itself to spell out clearly who planted them and how to defuse them.

The book is often vague about the causes of our problems, and reluctant to identify those responsible. For example, in its discussion of global warming, no mention is made of the Climate Council, a body uniting oil, coal and other corporate interests who have no intention of letting their profits suffer in the cause of ecological sanity. Similarly, the military-industrial complex receives only cursory treatment; yet the US armed forces are that nation's largest single institutional consumer of energy and therefore a significant contributor to the greenhouse effect, as well as to countless other environmental, economic and social problems.

More seriously, the book fails to face the fact that the defusing of the ecological timebomb requires the renunciation of many things that people now take for granted. This is not, one suspects, a message that appeals to some of the contributors. Gro Harlem Brundtland and Richard Branson, for example, are not known for their advocacy of steady-state economics and simple living. The born-again growthism of the Brundtland Report is questioned, but the obvious conclusions are not fully drawn.

Many of the contributors see solutions in terms of searching for new ways of satisfying human demands, rather than setting limits to them. For this reason, the otherwise excellent chapter on "crunching numbers" is unable to propose policies commensurate to the crisis of overpopulation it describes. Similarly, a special feature describes the "plight of the Alps", but cannot face the reality that the future of Alpine ecosystems depends on setting a limit to the amount of skiing facilities, hydroelectric dams and all further human encroachments. The chapter on air pollution meekly concludes with a call for "new technology", even though the data presented clearly suggests that people are going to have to accept reduced mobility regardless of specific improvements to present transport systems.

Porritt himself warns us to "beware the green technofix". But in general the book concentrates upon remedial technology, at the expense of important social issues. We find shocking images of misery and suffering, yet nearby are consolingly glossy pictures of optical fibres, magnetic levitation trains, superconducting ceramics and tidal barrages. We are told rightly that "basic issues of equity and per capita consumption" must be "far more honestly addressed by the affluent nations of the North", yet there is no suggestion of what this might mean in practice. Certainly there are very few contributors to *Save the Earth* who use their allotted space to examine what the ecological crisis will mean for individual lifestyles. One wonders how many of the more affluent contributors have questioned their own inter-continental jet-setting. Despite some excellent observations, mainly from Porritt himself, the overall message of the book suggests that a sustainable society will be not too different from our own.

Save the Earth's format is equally palliative: it divides much of the content into boxes of every shape and size, fragmenting the overall picture, with the risk that readers only sample the more palatable morsels. Ironically, Jonathon Porritt has produced simultaneously another book, *Captain Eco*, this time aimed at children. It is in a cartoon format, but not only is it easier to follow, its message is also surprisingly sharper and deeper.

Sandy Irvine and Alec Ponton

Sandy Irvine and Alec Ponton are the authors of *A Green Manifesto* (Optima, 1988).

Technological Extremes

IN THE ABSENCE OF THE SACRED, The Failure of Technology and the Survival of the Indian

Nations, by Jerry Mander, Sierra Club Books, San Francisco, 1991, \$25 (hb), 446pp. ISBN 0-87156-739-3.

Jerry Mander is best known for his book *Four Arguments for the Elimination of Television* (1978), which catalogued with admirable clarity the dangers and shortcomings of TV, arguing that these were not the result of misuse or abuse, but were integral to the nature of the technology.

In the Absence of the Sacred applies these themes to technology as a whole, though regrettably with less agility and precision. As Mander admits and the subtitle implies, it is really two books rolled into one: 'The Failure of Technology' and 'The Survival of the Indian Nations'.

In Part I, Mander builds up a picture of "megatechnology, the world wide technological creature", whose unstated purpose is "to expand its domination of both Earth and space, and to complete the utter conversion of nature into commodity form." We are sold technological innovations on the basis of "best-case scenarios", purveyed by television and the advertising industry. When reality turns out to be different — environmental decay, resource depletion and megalopolitan slums — we are promised another round of technofixes.

He unearths from the research departments of US universities some terrifying projections: giant parasols orbiting the Earth to cool it down; nanotechnology, or the molecular rearrangement of nature; and as a final post-biological solution, the "down-loading" of the entire content of the human brain into a molecularly engineered "soft robot", so that the redundant biological remains — our original brains and bodies — may be thrown into the incinerator. This, remember, is not science fiction; it is corporately funded scientific research.

Part II offers us the Indian native view as a contrast. Most indigenous tribes, Mander claims, possessed a culture that was democratic, sustainable and spiritually satisfying; they lived in close contact with nature and worked less than half as

long as the average white American does today. There are several chapters on the devious means employed by US governments to wipe out any remnants of this subversive way of life, followed by an overview of the situation for indigenous people globally. Finally, the two parts of the book are drawn together in a rambling and somewhat avuncular epilogue.

Mander shows himself once again to be a wide reader, a diligent compiler, and a dedicated campaigner; though there is perhaps not much in the book that breaks new ground. A long line of writers, from Aldous Huxley and Gandhi, through to Schumacher, Illich, and Mander himself, have pointed out the pitfalls of blind technological advance. A long line of Indians and campaigners have fought for native rights. Mander's achievement is to put the two together: technology is destroying nature; native Indians know how to live comfortably with nature; ergo, we should not only protect Indians, but also emulate them.

Unfortunately it is in the dual structure of the book that its weakness lies. By concentrating on the extremes of the discussion — megatechnology on the one hand, a subsistence economy on the other — Mander neglects the middle ground.

For instance, in a book purporting to be about technology and native peoples, one would expect to find in the chapter on Alaska some mention of the skidoo — the motor-powered sled that has encouraged widespread slaughter of walrus for their tusks. Mander gives us a cogent exposition of the way in which oil hungry corporate interests are destroying the Alaskan subsistence economy. But he makes no mention of the minor technological innovations, such as the rifle, the outboard motor and the sea-plane, that were drawing natives into the mainstream economy well before the construction of the pipeline.

Nor are the ambivalent attractions of cash crops fully examined. Mander describes how Indian gardens in Hawaii have been replaced by coffee monoculture, and how Forest People's lands in Zaire are threatened by coffee plantations. But when an Alaskan Yupik Indian defends his subsistence lifestyle in the same breath as he extolls the traditional virtues of a neighbourly cup of coffee, Mander glosses over the obvious implications.

The flaw in Mander's book, is his failure fully to acknowledge that the threat to subsistence cultures comes not only from centralized technology and corpo-

rate greed, but equally from people's desire for the small tools, electrical goods, and imported foods and drugs that eventually are taken for granted.

Yet it is in the area of tools at least that some steps to stop the juggernaut of progress may soon be made. The world wide banning of monofilament driftnets over a certain length is likely soon to come into force. If so, it will be perhaps the first time a technology has been outlawed for being too efficient. It is a small step from this to banning four wheel drive vehicles from extractive reserves, skidoos from hunting areas, fishfinders from trawlers, chemicals from farmlands or cars from cities, wherever it may be deemed wiser to do so.

The Luddite challenge to technology is not, as technophiles paranoiacally maintain, a "return to the stone age", but an attempt to draw sensible lines between what is desirable, and what is disastrous. *In the Absence of the Sacred* is helpful, in that it describes the extreme boundaries of the discussion: post-biological versus prehistoric, megatechnology versus Mother Earth. But it is in the middle ground that work has still to be done.

Simon Fairlie

Oh Maize of Scotland

GLOBAL WARMING: The Debate, edited by Peter Thompson, John Wiley, Chichester, 1991, 130pp. ISBN 0-471-93157-8.

If action to reduce the greenhouse effect were left to some of the contributors to this book, it is doubtful whether much more would result than a deluge of hot air.

Global Warming: The Debate contains the transcripts of a conference organized in London by the consultancy Strategy Europe in April 1991. The contributors include a wide range of scientists, academics and industrialists. There are sections on the scientific debate, energy and transport policy, potential legislation, economics and the business response to global warming.

The combined efforts of the partici-

pants are spiced with a mixture of complacency, conservatism and caution. Many of the contributors express serious doubt that global warming is developing at anywhere near the alarming pace which most forecasters predict. There is a fiery attack by Professor Patrick Michaels, for example, a prominent "greenhouse sceptic", who argues that world temperatures may be volatile for reasons not associated with the greenhouse effect. "The uncertainties are such that we cannot expect the world to suddenly take immediate drastic action which would be very expensive and would create a great deal of problems in itself," as one speaker puts it. "I am quite relaxed over the possibility of growing maize in Scotland," another adds.

When it comes to solutions, there is much defending of corners, whether on the part of the nuclear industry, coal lobby or the transport business. Nobody wants to shift much ground. Perhaps the most astonishing contribution is from Professor Donald Pearlman, a former assistant to the US Secretary of Energy, who sees no reason why his country should set any limits on CO₂ emissions or allow its cheap fuel economy to be dented. This mirrors the argument put by several other contributors that the "advanced" economies cannot accept measures which will damage their economic structures, and certainly not, as one speaker asserts, because of "an uninformed rush to judgement".

There are a few original contributions here, such as an incisive essay from Andrew Davis of the Environmental Transport Association, who clearly shows the need to beat back the dictatorship of the automobile. Christopher Hampson of ICI is also interesting on how business is approaching this issue, not least for his promotion of combined heat and power stations. But at a practical level, this book suffers greatly from being a compilation of speeches (not even structured papers, it seems) and therefore woolly at the edges.

Finally, none of this augurs well for the current negotiations over an international agreement on specific targets for tackling global warming, towards which this book is supposed to be a contribution.

Crispin Aubrey

Crispin Aubrey is a freelance writer on energy issues, based in Somerset, England.

BOOKS DIGEST

- **ECOLOGICAL ECONOMICS AND GLOBAL CHANGE: *Aspects of Research***, by Gerhard Maier-Rigaud, Institut für Europäische Umweltpolitik, Bonn, 1991, DM26.50 (pb), 77pp. ISBN 3-89347-005-0.

A brief, pungent essay in which an economist argues that cost-benefit analysis (CBA) cannot identify "optimal" paths for policy changes. Maier-Rigaud views sceptically economists' claims that CBA is politically necessary because "politicians want figures", noting that it is economists themselves who have taught them to do so.

- **DESIGN FOR THE REAL WORLD**, by Victor Papanek, Thames and Hudson, London, 1991, £10.95 (pb), 394pp. ISBN 0-500-27358-8.

A revised second edition of this seminal book, which has been out of print in Britain since 1977. Influential ideas and stimulating proposals for artificial seed pods, beer can bumpers, half-horsepower tractors, tamperproof containers and computer-assisted rigging for tall ships.

- **A VISION FROM THE SOUTH: *How Wealth Degrades Environment: Sustainability in the Netherlands***, by Mercio Gomes, Chandra Kirana, Sami Songanbele and Rajiv Vora, Jan van Arkel Publishers, A. Numenkade 17, 3572 KP, Utrecht, Netherlands, 1992, Dfl.17.50 (pb), 128pp. ISBN 90-6224-994-9.

Writers from Brazil, Indonesia, Tanzania and India take a six-week tour of Holland, where there are six million cars for 15 million people, and where animal dung is a major environmental problem. They conclude that it is "ultimately the concentration of power involved in the allocation of wealth that causes environmental degradation".

- **THE SUBSIDY FROM NATURE: *Palm Forests, Peasantry, and Development on an Amazon Frontier***, by Anthony B. Anderson, Peter H. May and Michael J. Balick, Columbia University Press, New York, 1991, \$40.50 (hb), 233pp. ISBN 0-231-07222-8.

A study of the Brazilian babassu palm, by an ecologist, an economist and a botanist. This tree has an exceptionally high leaf biomass, permitting shifting cultivators to use the leaves for fuel and other purposes, while leaving the tree standing. However it is now being eradicated for pasture and plantations. A specialist book, but very readable.

- **STATE OF THE WORLD 1992**, by Lester R. Brown and others, Earthscan, London and W.W. Norton, New York, £9.95/\$10.95 (pb), 288pp. ISBN 1-85383-117-4 (UK), 0-393-30834-0 (US).

The Worldwatch Institute's annual report for 1992 covers biodiversity, sustainable energy, nuclear waste, livestock, motherhood, mining, urban planning, sustainable employment, global environmental governance and launching the environmental revolution.

- **WEALTH BEYOND MEASURE: *An Atlas of New Economics***, by Paul Ekins with Mayer Hillman and Robert Hutchinson, Gaia Books, London, 1992, £9.99 (pb), 191pp. ISBN 1-85675-050-7.

A popular exposition of green economics by the first director of The Other Economic Summit (TOES). The "dismal science" is made less dismal by a fully-illustrated, double-page spread format. Adam Smith gets six mentions in the index, Marx none at all.

- **THE RIVER OF THE MOTHER GOD *And Other Essays*** by Aldo Leopold, edited by Susan L. Flader and J. Baird Callicott, University of Wisconsin Press, Madison, Wisconsin, 1991, 384pp. ISBN 0-299-12760-5.

Fifty-nine essays from the US author of *A Sand County Almanac*, one of the first writers to bring ecological notions to the attention of the public. The earliest essay, 'A Tramp in November' dates from 1904, the latest, 'The Ecological Conscience' was written in 1947, a year before his death.

Simon Fairlie



Letters

Whispers in the Dark and the Urgent Task

Dear Sirs,

Your editorial 'Dismal Green Science' (Larry Lohmann, Vol. 21, No. 5, 1991) was timely, arriving as it did during our course on Ecological Economics here at Schumacher College. It provoked a lively discussion. Whilst we appreciate the author's intention of identifying the limitations of accounting for Nature, we feel that he not only missed an opportunity to be constructive, but, in lampooning serious attempts to integrate economics and ecology, he managed to sow unnecessary confusion.

The piece started with the common accusation that opponents of the author's views are one-dimensional ("those who see modern economics as the social reality . . ."; "the only question . . . is what sort of economics") when this narrow vision is patently not true. Writers like Daly, Porritt and Lester Brown are explicitly concerned with the non-economic dimensions of life. They choose, however, to encompass economics, since they recognize the important influence that it has on the way in which societies are organized.

The article goes on to pose the central question that we all wish to address, that of finding "the wisdom we need to get through the generations" (which is a more lyrical way of describing sustainable development), yet mocks the proposals from green economists that it be done by estimating environmental prices, based on estimates of what Nature will bear, and setting biophysical limits.

The "usual fallible individuals in three-piece suits" will get it wrong, says Mr Lohmann, unlike "peasants in Asia" who use "cultural taboos", who "ask permission of local woods and streams" and who

know "what will offend the spirits in their local areas". Such traditional methods may well work on home ground but, as Mr Lohmann himself points out, translating ideas and languages from one set of "particular historical circumstances" to another very different set does not usually work. We could hardly ask the people along the Rhine or in the Black Forest to whisper to the river and forests in the hope of finding a way to protect these resources for future generations.

It is certainly going to be difficult setting biophysical limits (and non-rational, non-price considerations will be part of the process) but that is no reason for not trying. And, contrary to Mr Lohmann's thoughts, whatever "failures of resource management" we encounter will not destroy the "image of Nature as a store of capital from which we must take only the interest". Whilst there are many other, more aesthetically compelling, images of Nature, we cannot escape the store-of-capital idea when we are talking about economics. Does Mr Lohmann think we can get by without touching any of Nature's capital, such as water?

Next, the piece briefly considers some of the very real difficulties that may be experienced in putting monetary values on environmental goods, but concludes that environmental economics may not be able to "assimilate the rich variety of views" into a "sustainable economy". It won't try to. Successfully incorporating just some of the gross yet unaccounted external costs of environmental damage into prices will make a substantial difference.

Finally, having conceded that "just and effective environmental taxes and cost-benefit analyses" may halt "mega-projects" (a surprising conclusion given the general thrust of the argument) the editorial ends by staking out a "foothold in the rough ground" where real people can take their stand "outside the grasp of the industrial economy". We believe that dealing with the problems of the industrial economy and confronting conventional economics will not prevent us from basing our actions on compassion, perception and insight.

Of course it is true that some "rivers and forests are saved by those who force economic leaders to learn their language". Meanwhile, thousands of others are destroyed by the conventional economic juggernaut, which ecological economics is trying to supplant.

Whispering in the dark may help save some areas but without economic reform the "dismal science" may well destroy us.

Nature, and future generations, will not thank us for shirking the urgent task, described by Anil Agarwal as preventing the Gross National Product from destroying the Gross Natural Product.

Yours sincerely,

**Manfred Max-Neef and Participants
on the Course on Ecological
Economics, December 1991**
Schumacher College
Dartington
Totnes
Devon TQ9 6EA

Larry Lohmann replies . . .

The importance of distinctions such as those between nature-as-commons and nature-as-capital, peasant self-limitation and "sustainable development", rationality and "economic rationality", and local knowledge and knowledge which pretends to universality, is, as Illich, Alasdair MacIntyre and other writers have observed, "apt to be invisible" to those of us whose "first language is one of the internationalized languages of modernity".¹ By treating such distinctions as of mere aesthetic or marginal significance, Max-Neef and colleagues are tacitly dismissing those whose livelihoods depend on them, thus undermining their own project of an environmentalism based on "compassion, perception and insight".

Whatever their merits as political tactics in certain societies, the creation and "correction" of prices and the invention of "biophysical limits" for economies, when adopted as guiding environmentalist principles, reinforce and spread the practice of treating nature as a scarce resource, and encourage the unrealistic attempt to replace the multiplicity of "internal" cultural limits by a few monolithic "external" market- or state-based constraints.² This amounts both to taking the side of the powerful few in innumerable bitter political conflicts and to slighting crucial possibilities for cross-cultural comparison and self-correction in modern societies. Treating the dichotomy "nature must be either viewed as capital or left untouched" as self-evident, for example, as Max-Neef et al. do, is not only historically ignorant but also unwittingly contemptuous of most of the world's peoples, who have been inclined to use or abuse nature without treating it either as capital or as an object of modern management, and to whom this dichotomy, like the trichotomy of private property, public prop-

erty, and "open access", would appear either false or unintelligible.³

Opposing the dominance of the economic worldview, finally, does not entail endorsing the claim that there is an "alternative" approach to nature which "gets it right" (there is no universal "it" here to "get right" nor any group of people privileged to decide for us all what that "right" might be) and which therefore can be universally imposed on the Black Forest, the Rhine valley, and everywhere else. To make this inference is to attribute economism's own universalizing tendencies to its opponents and thus to set up a particularly flimsy straw man, since it is precisely this sort of universalism they resist.

References

1. MacIntyre, A. *Whose Justice? Which Rationality?*, Duckworth, London, 1988, p.385. See also Ivan Illich, *Shadow Work*, Marion Boyers, London, 1981, p.72, and *Gender*, Pantheon, New York, 1983, pp.17-21; Larry Lohmann, 'Who Defends Biological Diversity?', in Vandana Shiva et al. *Biodiversity: Social and Ecological Perspectives*, Zed, London, forthcoming.
2. Banuri, T. 'Development and the Politics of Knowledge', in F. Apffel Marglin and S.A. Marglin (eds.) *Dominating Knowledge: Development, Culture and Resistance*, Oxford, 1991. See also Wolfgang Sachs, 'The Gospel of Global Efficiency', *IFDA Dossier* 68, 1988, pp.33-39.
3. On the nature-as-resource idea as a historical phenomenon within academic science, see Donald Worster, *Nature's Economy*, Cambridge, 1977, and Worster (ed.) *The Ends of the Earth*, Cambridge, 1990. On the confusion between common property regimes and "open access", see Daniel W. Bromley, *Environment and Economy: Property Rights and Public Policy*, Blackwell, Oxford, 1991.

Holies, Hippies, Cowboys, Wilders

Dear Editor,

In Bron Taylor's article on Earth First! ('The Religion and Politics of Earth First!', Vol. 21, No. 6, 1991), he totally misses the point on my differences with Dave Foreman, which have little to do with strategy and tactics, and even less to do with religion. I broke with Foreman's *Earth First!* Journal when he refused to print my rebuttal to his editorial that was critical of ongoing campaigns to save old-growth forests in the Pacific Northwest. Foreman argued, as did the timber industry, that we should be dismissed as west-coast hippie flag-burners. I had attempted to explain that we were continuing a campaign begun by Earth First! in 1982 to stop the

logging of the remaining temperate rainforests, and that we weren't all hippies and had never burned a flag. In the next issue, I was accused of the worst of crimes: anthropocentrism.

Foreman's later decision to distance himself from Earth First! followed on the heels of his arrest by the FBI for conspiracy to commit sabotage against nuclear power plants in Arizona in 1989. Since then he has missed few opportunities to criticize Earth First! for straying from the one true path, using as Taylor does, the myth of the Cowboy/Hippie schism to frame the debate. The fact is that Earth First!, although admittedly a diverse group, remains united on the principles of protecting wilderness and biodiversity. While violence against property has always been a controversial topic, we have never taken a position on it, one way or the other. Many people in Earth First!, myself included, feel property destruction can be justified, especially when other alternatives have been exhausted, and that both civil disobedience and monkeywrenching are important tools for the wilderness activist.

Although Mr Taylor has done his homework, he relies heavily on press accounts and magazine stories. Not only is he mistaken when he labels me a "holie" (read hippie) rather than a "wilder" (cowboy), these labels do little to enlighten us

about the true nature of the current debate within the US deep ecology movement. Many of us feel Mr Foreman's embrace of knee-jerk conservatism is disturbing considering his reputation for making racist statements. One need only compare Foreman's earlier writings with his post-conviction statements to determine that it is Dave Foreman, not Earth First!, that has undergone a radical re-making.

Sincerely,
Mike Roselle
Co-Founder, Earth First!

Bron Taylor Replies . . .

I appreciate Mike Roselle's helpful clarification on his differences with Dave Foreman. His desire to not be identified with any given faction is also understandable — especially since few in Earth First! fit perfectly into the two major factions I described — and I did not mean to imply that he does either. But while labels are always problematic, human beings inevitably use them to help understand their world. Earth First!ers are among the most creative label-makers I know. Indeed, because such labelling is so common in the movement, and because these labels virtually always have positive or negative evaluations embedded within them, I invented my own labels, in the effort to be fair-minded to all concerned.

It is true that I did not discuss all the important disagreements within the movement. Future writing will remedy these omissions. But it is not accurate to equate my labels with the terms "hippies" and "cowboys" — there is much more detail and nuance to my terms than Mr Roselle's criticism acknowledges. Nor is it accurate to imply that I missed how, despite the factionalism, unity remains with regard to defending wilderness and biodiversity (see p.263 of my article: "both factions remain biocentric").

"The map is not the territory" is a slogan I have often heard from Earth First! activists. Just as we forget this to our peril in the wild, so we also do when we read descriptive analysis. We must not confuse scholarly typifications with the social territory — for such characterizations will never be perfect. The question is, do they illuminate our way and provide a basis for a better, more detailed map later? I consider 'The Religion and Politics of Earth First!' to be a good initial map, in the process of being made better.

**"a guerrilla handbook for
doing battle with multi-
national corporations"**

Runder!
by Roger Moody

Published jointly by People Against
RTZ and its Subsidiaries (PARTIZANS)
and the Campaign Against Foreign
Control of Aotearoa (CAFCA).

200 pages of facts, figures and
analysis about the activities of Rio Tinto
Zinc. RTZ and its subsidiaries, with
operations in over 40 countries, have
displaced native peoples, contaminated
environments, violated sacred sites and
ignored safety standards.

Price £4.95 plus postage (UK £1.05;
Europe £1.40; Elsewhere £4.80).

Send cheque or postal order to **WEC
Books, Worthyvale Manor,
Camelford Cornwall PL32 9TT, UK.**



UNIVERSITY OF LEEDS

GRADUATE STUDIES SCHOOL OF BUSINESS AND ECONOMIC STUDIES

Applications are invited for the following MA courses which are offered on a full-time and part-time basis.

- MA in Industry and Labour Studies
- MA in Gender and Work
- MA in Development Economics
- MA in Economics
- MA in Economics and Finance
- MA in Transport Economics (full-time only)
- MA in Modern European Economy

The above courses are recognized by ESRC for student scholarships

A limited number of School bursaries may be available for outstanding candidates.

Application forms and further details may be obtained from the Postgraduate Secretary, School of Business and Economic Studies, University of Leeds, LS2 3JT.
Telephone: 0532 334469.

THE UNIVERSITY OF LEEDS

MA IN DEVELOPMENT STUDIES

This MA programme offered by the Centre for Development Studies has inputs from the various social science disciplines as well as from other faculties. It is conceived as an alternative to programmes which turn out narrow specialists unaware of the broader context of development, or, conversely, produce generalists lacking any concrete skills or area of specialised knowledge.

It is built around an interdisciplinary core course covering theory, strategy and issues in development. Students also take two of a wide range of specialist options in such areas as rural development; women and development; project appraisal; business, state and world economy; and development economics; as well as others in geography, education or health administration. Finally, an area of particular concern is explored in depth in a dissertation.

The course is designed for graduates in the social sciences, but practical experience of problems of developing countries is also taken into consideration. It provides an opportunity for those active in the field to upgrade their skills and consolidate their knowledge, as well as a chance for those with a strong interest in the subject area to deepen their understanding of development issues.

For more information apply to: Dr C Baylies, Director, Centre for Development Studies, University of Leeds, Leeds LS2 9JT, UK

MA IN THE POLITICS OF INTERNATIONAL RESOURCES AND DEVELOPMENT

This MA programme offered by the Department of Politics provides an opportunity for detailed analysis of recent dramatic changes in the international political economy and their implications for development, and in turn relates these to key social and political features of developing countries. It thus links the fields of international politics and political economy of development.

It focuses on resource allocation; the relationship between state and economy; the role of multinational corporations and international agencies; and questions of food security and sustainable development.

It is suitable for students seeking training from a political perspective in development theory and policy or for those working in ministries or NGO's requiring further expertise in the management of state and business relations or in handling resource, environmental or food security policy.

For more information apply to:

The MA Admissions Tutor, Department of Politics,
University of Leeds, Leeds LS2 9JT, UK. Tel: 0532 334382.

A limited number of grants and scholarships, which either fully or partially offset the cost of academic fees, are offered by the University of Leeds to overseas students on a competitive basis.

Department of
Applied Energy

Cranfield

MSc THERMAL-ENERGY PROCESSES

This unique course of lectures, team case-studies and industrial visits will help you to become one of the most sought-after post-graduates in the UK. Upon completion, your portfolio will include:

Heat Transfer and Fluid Flow

Environment Management

Induction, Microwave and Infra-Red Technologies

Renewable Energy Systems

Social-Psychological Aspects of Energy Use

Energy-Conscious Design

This course is industrially-sponsored and may be taken on a full-time or part-time basis. Grants are available for EEC citizens.

Please send me details of the THERMAL-ENERGY PROCESSES
MSc course

Name

Address

Telephone

To: Dr M Newborough, SME (ref 2399), Cranfield Institute of Technology, FREEPOST, Bedford MK43 7BR, or Phone: (0234) 750111, ext 2291.

Emerson College

School of Bio-dynamic Agriculture & Rural Development
20 years pioneering training and other services in ecological agriculture worldwide

Training - Agricultural development in temperate and tropical zones; farming and gardening.

Courses range from one year to three years; one/two weeks courses in summer; international workshops & conferences; lectures & talks.

Documentation & Information

Research & Experimentation

Bio-dynamic Farm & Garden (20 & 15 years)

ROP Network (since 1979)

• support for community development in the Third World.

• support to Third World farmers, groups & NGOs on the basis of bio-dynamic and ecological systems.

• consultancy

For more details please contact:

Emerson College, Forest Row, E. Sussex, RH18 5JX

tel: (034282) 2238 or 4622; fax: 4949.



Centre for Development Studies Swansea

The Centre offers the following courses for development workers, administrators, planners and academics.

B.Sc. (Econ) Single Honours Degree in Development Studies and Joint Honours programmes with Economics, Geography, Sociology, Social Anthropology, Politics and Spanish.

The Centre also offers 10-week specialised courses and individual study programmes.

For further details of the above courses and application forms, please write to:

The Admissions Secretary, Centre for Development Studies
University College of Swansea, Singleton Park, Swansea SA2 8PP
Wales, United Kingdom
Tel: 0792 295332 Fax: 0792 295582 Telex: 48149 UICS G

COURSES



UNIVERSITY OF BRISTOL

MSc & Diploma Course in DEVELOPMENT ADMINISTRATION & PLANNING

Comparative Development & International Policy Studies

Full-time one year; part-time two years; intensive courses of 2-12 weeks.

For further information and application forms, please write to: Professor Peter Townsend/Pervaiz Nazir, Department of Social Policy and Social Planning, University of Bristol, 8 Woodland Rd, Bristol BS8 1TH
Telephone: 0272 288504
Fax: 0272 288578



Heriot-Watt University/Edinburgh College of Art

CENTRE FOR ENVIRONMENT AND HUMAN SETTLEMENTS

CEHS provides postgraduate facilities for professionals and academics working in Environment, Human Settlement and Shelter Planning in the less developed countries. Programmes of study are offered leading to Diploma and Master's Degree, and to the research degrees of MPhil and PhD.

Enquiries to:

Director

Centre for Environment and Human Settlement
Heriot-Watt University/Edinburgh College of Art
Lauriston Place
Edinburgh EH3 9DF, Scotland, UK.
Tel: 031-229 9311; Fax: 031-229 6702

CEHS is a member unit of the Edinburgh School of Environment Design (University of Edinburgh/Heriot-Watt University/Edinburgh College of Art).

Classified

HOLIDAYS

FRENCH PYRENEES Fairytale cottage set in magnificent unspoilt woodland valley. Excellent walking, wildlife, birds, butterflies, flowers. Tel: 01033 6166 5127/6166 7619. Write: Gunning, "Rour", Moulis, 09200, St Giron, France.

GREEN HOUSE GUEST HOUSE. Peaceful, luxurious, friendly. Wholefood, vegetarian, vegan. Leeds 0532 681 380.

MISCELLANEOUS

GROW YOUR OWN GINSENG. Two 1st class stamps for information package. The Ginseng Store, Ground Floor, 8 Elms Close Terrace, Newlyn TR18 5AU.

Classified Advertising Rates:

Word rate 40p per word, min. 20 words
Display £5.00 per scdm, min 3 scdm
Box No £2.50 extra. All excl. VAT
To: Worthyvale Manor, Camelford,
Cornwall PL32 9TT, UK

DIARY DATES

OXFORD UNIVERSITY SUMMER SCHOOL FOR ADULTS

18 July – 22 August 1992

45 one-week seminars including Conservation, Landscape History, Natural History, "Super Sense", Archaeology, Astronomy, Literature, Music etc.

Also: Saturday Day Schools: DOGS (15 February):
HEDGEHOGS (9 May)

Contact: Anna Sandham, OUDCE, 1 Wellington
Square, Oxford OX1 2JA

Tel: 0865 270396/270360

SUSTAINABLE CITY – A European Forum. Brighton 2-5 April 1992. An exciting programme offers authoritative speakers, workshops, case studies etc. Details from: Lewis Cohen, Urban Studies Centre, Brighton Polytechnic, 68 Grand Parade, Brighton BN2 2JY, UK: Tel. 0273-673416, Fax: 0273-679179.

FOREST 92. Second International Symposium on Environment Studies of Tropical Rainforests. May 24-29, 1992 Rio de Janeiro, Brazil. Details from Comisseo Org. P.O. Box 3591, Av. Pasteur, 404/3° (CPRM), Urca, Rio de Janeiro, RJ, CEP 22290, Brazil. Tel: 021-295 4347, Fax 021-262 5946.

EARTH IN FOCUS. London's first Int. Film Festival, Geographical Society. April 22-26, 1992. Contact V. Cliff Hodges, Tel: 071 580 4350, Fax: 071 580 2308.

Meeting of the European Association of Environmental and Resource Economists, Cracow, Poland, 16-19 June 1992. Tel: 48 12 210099, Fax: 48 12 212182.

Int. Meeting **SYSTEMATICS AND CONSERVATION EVALUATION.** Natural History Museum London, 17-19 June 1992. Details from Peter Forey, Cromwell Road, London SW7 5BD. Tel 44 071 938 8843, Fax 44 071 938 9277.

PUBLICATIONS

New Titles in the Worldwatch Paper Series:

- No 104: Jobs in a Sustainable Economy
- No.105: Shaping Cities: The Environmental and Human Dimensions
- No. 106: Nuclear Waste: The problem that won't go away.

£3.00 each plus £1.00 postage for up to 3 titles UK and £1.50 overseas. Also available latest Worldwatch Institute 'State of the World' at £6.50 plus postage £1.50 UK and £3.00 overseas. Worthyvale Manor, Camelford, Cornwall PL32 9TT, UK. Visa, Mastercard and Eurocard accepted.

'Ecology is a way of looking at the world, a subjective and emotional way, not just an objective and rational one. It involves seeing the world with wonder, with awe and with humility – as something to feel part of, to love and to cherish rather than to exploit'

the way

an ecological world view

by

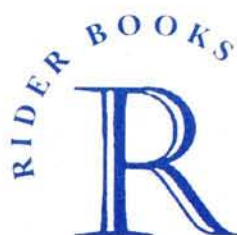
edward
goldsmith

'a truly radical analysis of modern science'

jerry ravetz

To order your copy call our credit-card
hotline on **0279 427203**

Rider books are available
from all good bookshops



Publication date: 7th May Hardback £18.99 Paperback £8.99