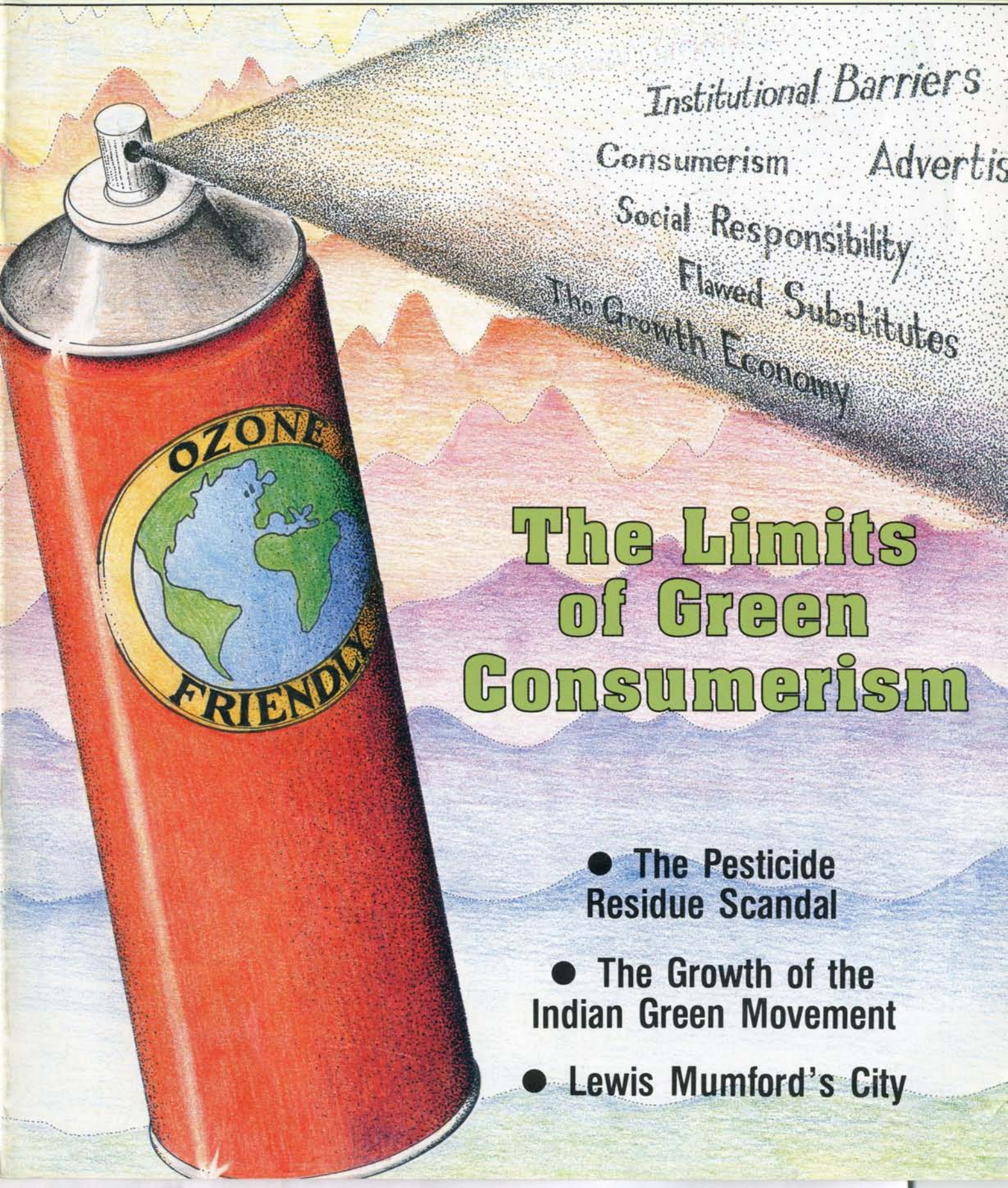


# The Ecologist

Vol 19 No 3 1989

£3.00 (US\$6)



## The Limits of Green Consumerism

- The Pesticide Residue Scandal
- The Growth of the Indian Green Movement
- Lewis Mumford's City



# PEOPLE IN THE LANDSCAPE



There was a time when conservation initiatives tended to leave out people. But if the world's remaining natural forests are to survive, then the people who live by them must be consulted. This is as true in the Andes of Southern Ecuador as it is anywhere else in the world.

The Rio Mazán Project was formed in response to an invitation to survey a small cloudforest reserve near the town of Cuenca which was saved from logging by public protest. Only isolated patches of cloudforest now remain in the High Andes, each one home to a unique range of endangered species. Few of them can be made reserves,

although they are all important for watershed, wildlife and soil conservation, because local people rely on them as a source of food, medicine, firewood, and timber.

Using the Rio Mazán Reserve as a resource, the Project is now helping to produce programmes in environmental education. A visitors' centre, nature trail, and two more permanent wardens are needed on the site. The Project has also been invited to survey more forests in the region, and to help produce management plans for them so that their natural resources can be used sustainably, and they can survive.

## WE ALL NEED THE WORLD'S REMAINING NATURAL FORESTS.

Project members' work is entirely voluntary, but expenses are considerable. Please support us so that our work can continue. Please make a donation or become A Friend of Mazan and receive the newsletter.

The Development &  
Environment Centre  
38-40 Exchange Street  
Norwich NR2 1AX  
0603 611953/610993  
Registered Charity No. 298686

Our patrons are:  
Prof David Bellamy  
Prof A. Bradshaw FRS  
Dr Malcolm Coe RGS  
Anthony Huxley VMH  
Max Nicholson CB CVO LLD

## The Ecologist Journal of the Wadebridge Ecological Centre

Published by: Ecosystems Ltd., Edward Goldsmith.

Editors: Edward Goldsmith, Nicholas Hildyard, Peter Bunyard. Assistant Editor: Patrick McCully.

Associate Editors: Robert Prescott-Allen, Jimoh Omo-Fadaka, Andrew MacKillop, Jerry Moles, Robert Waller, Lawrence Hills, John Papworth, Nicholas Gould, Raymond Dasmann, Richard Wilson, John Milton (USA), Sigmund Kvaloy (Norway), Wouter Van Dieren (Holland), John Seed, Rain Forest Information Centre (Australia), Henryk Skolimowski, Samuel S. Epstein.

Editorial Department: Corner House, Station Road, Sturminster Newton, Dorset. Tel: (0258) 73476. Office Manager: Diane Platt-Higgins.

Subscription Department: Worthyvale Manor Farm, Camelford, Cornwall PL32 9TT. Tel: (0840) 212711. Subscriptions Manager: Maria Parsons.

### Annual Subscriptions:

The Ecologist publishes six numbers a year.

The Rates below are for 6 issues including postage and annual Index:

Ord. Rate £18.00 (\$30.00)  
Inst. Rate £30.00 (\$50.00)  
Third World & Student Rate £15.00 (\$25.00)  
Air Mail Rate £9.00 (\$15.00) extra

Subscriptions are payable to The Ecologist and sent to The Ecologist, Subscription Department (Address above).

The Ecologist Bankers: National Westminster Bank Ltd., 26 Molesworth Street, Wadebridge, Cornwall, UK.

Special Rates available for people who need The Ecologist for their work, but have difficulty in paying the full rate, please don't hesitate to write to us.

### Advertisements:

#### Display Rates:

Full page (261x185mm) £250  
Half page (131x185mm) £125  
Third page (131x121mm or 261x58mm or 87x185mm) £90  
Quarter page (131x93mm) £75  
Sixth page (87x55mm) £60  
Full colour back page £400

#### Inserts:

Up to 261x185mm and not more than 10g £35 per thousand.

#### Enquiries to:

Editorial Department  
(Address above).

### Contributions:

The Editor welcomes contributions, which should be typed, double spaced, on one side of the paper only, and with generous margins. Contributions should be accompanied by black and white photographs, line drawings, and tables where appropriate.

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

Output by Windsorgraphics, Kings House, Kings Arms Lane, Ringwood, Hants. Tel (0425) 474936  
The Ecologist International Serial Number is: ISSN 0261-3131

Printed by Penwell Ltd, Parkwood, Callington, Cornwall. PL17 8AD. Tel (0579) 50522/50941

The Ecologist is available on Microfilm from University Microfilms Int., Ann Arbor, MI, USA.

## Editorial

*Peter Bunyard*

**Brazil and the Amazonian Pact . . . . . 86**

## Feature Articles

*Sandy Irvine*

**Consuming Fashions? The Limits of Green Consumerism . . . . . 88**

The current rash of books and articles on 'Green Consumerism' avoid many of the real issues. 'Environment friendly' cars and aerosol cans are a step in the right direction, but without major changes in our growth-led economic systems there is no hope of establishing a truly sustainable society.

*Peter Snell*

**Pesticide Residues: The Scandal Continues . . . . . 94**

Recent reports in Britain and America have highlighted the unacceptable levels of pesticide residues in food. Official efforts to allay public concern have been inadequate and at times dishonest.

*Timothy Weiskel*

**The Ecological Lessons of the Past: An Anthropology of Environmental Decline . . . . 98**

The underlying factor behind the collapse of many ancient civilisations was the overexploitation of their natural resource base. Industrial civilisation, in spite of its technological prowess, depends for its perpetuation on fast disappearing natural resources, in particular those essential for food production. Yet there is no such thing as a 'post-agricultural' civilisation.

*Grover Foley*

**Mumford on the City . . . . . 104**

The "master interpreter of the city", Lewis Mumford, believed that cities have physical and social limits which must be respected if the city is not to collapse under the weight of its own success. Cities must be decentralized and must incorporate human-scale architecture and technology.

*Vandana Shiva and  
Jayanta Bandyopadhyay*

**Development, Poverty, and the Growth of the Green Movement in India . . . . . 111**

The development process in India, as in the rest of the world, has led to intensive resource demands which have undermined the productive potential of natural ecosystems and created severe ecological instability. The emerging ecology movement, however, is reassessing natural resource use and the ideology of economic development.

## Report

*Martin Arnould*

**Damming the Loire . . . . . 118**

## Feature Book Reviews

*Wolfgang Sachs*

**The Gospels of Global Efficiency . . . . . 119**

*Edward Goldsmith*

**Scotland's White Revolution . . . . . 120**

**Books Digest . . . . . 122**

**Letters . . . . . 123**

Cover Artwork: Brendan Farren. Cover Layout: John McIntyre. Printed on unbleached recycled paper.

# Brazil And The Amazonian Pact

Brazilians are up in arms against the foreigners who are protesting at the destruction during the past three years of an area of Amazonia three to four times the size of Great Britain. The Brazilian government claims that interfering foreigners are embroiled in a conspiracy to divest Brazil of its sovereignty, and some Brazilians are complaining that these foreigners are hypocritically picking on Brazil when they have turned their own countries into environmental sewers.

In fact, President Sarney and his government have been swift to use outside criticism of what is happening in the Brazilian Amazon to whip up nationalistic fervour, thereby deflecting internal criticism of the inept social policies which have brought about the migration of thousands of landless peasants from rich agricultural lands to the infertile tropical soils of the Amazon.

In the Brazilian newspaper *O Globo* (March 3, 1989) President Sarney is quoted as saying: "We do not accept to be submitted to some international body which wishes to give us orders on the way we should use our nature. We would never allow Amazonia to be turned into some kind of green Persian Gulf. We reject absolutely all outside interference."

M. Janio Quadros, previously head of State and a candidate in next November's presidential election, used the opportunity to send a telegram to Sarney, congratulating him on his patriotism, and affirming that "All those who intend to internationalize Amazonia will be affronting the patriotic nationalism of the Brazilian people." (*O Globo*, March 7, 1989).

And just to show where the military stood in the debate, two generals, Leonidas Pires Gonçalves and Bayma Denys, rattled their sabres and, as reported in *Gazeta Mercantil* (February 20, 1989), stated that "we would not admit to the renouncing one-thousandth of one millimetre of our Amazon." The generals then instructed Sarney not to attend the environmental conference in the Hague so that "Brazil should not stand on the bench of those accused." Sarney dutifully obeyed.

## The Amazonian Pact

Brazil claims that it has support for its policies in the Amazon from all the other countries of the Amazonian Pact — Ecuador, Peru, Bolivia, Guyana, Suriname, Venezuela and Colombia. This claim is based on one small paragraph in the declaration resulting from the Third Meeting of the countries of the Treaty of Amazonian Cooperation in Quito during 6-8 March, where reference was made to the rejection of any external interference in the policies and actions of the member countries concerning Amazonia.

On March 7, *O Globo* victoriously announced "Amazon, seven countries give their support to Brazil." In the Colombian newspaper, *El Espectador*, on the same day, the headlines announced "The Amazonian countries back Brazil's ecological management." *El Espectador* went on to say that the seven other countries of the pact were fully satisfied with Brazil's Amazonian

policies and quoted Diego Cordovez, the Chancellor of Ecuador, as saying: "Brazil explained in detail the environmental policies it is pursuing, given that they have not always been properly understood. That information satisfied us completely."

In fact, owing to international criticism, Brazil thought it necessary during the meeting in Quito to bring forward the idea of creating a special commission for the conservation of natural resources. This idea, which had already been mooted by a number of the other pact countries, was warmly welcomed and discussed. The result was a final document, approved by all the Treaty members and signed by the foreign ministers. However, that signing in no way meant that the other pact countries actually approved Brazil's current Amazonian policies and the way it has treated the forest and its dwellers. But, to avoid any open clash among the Amazonian countries, no evaluation or discussion on the impact of any country's current Amazonian policies was made during the meeting.

## Growth and Conservation

In the resolution establishing the environmental commission, the member states agreed that there had to be a balance between economic growth and environmental conservation, the aim being to achieve both ecological equilibrium and the preservation of species. They also reiterated the need for coordinating environmental policies so that they could exert joint political responsibility over the use and protection of their "important natural and cultural heritage".

The Amazonian countries have also agreed to set up a commission to promote cooperation over indigenous affairs between the Amazonian countries, and in so doing to promote the strengthening of ethnic identity as well as the conservation of the historico-cultural heritage. Resolution (d), for example, calls for the effective participation of the indigenous populations of each country of the Amazon in all aspects of their affairs, including in the planning of any development project and in the execution of whichever type of programme that may affect them. The member countries are therefore called upon to promote development programmes that reflect the real aspirations and needs of Amazonian peoples and to guarantee the direct participation of indigenous peoples in the direction of these programmes. It is also proposed that the member states should allow free cross-border contact and interchange between indigenous populations.

With regard to environmental policies in general, the question of foreign interference in the internal affairs of any of the countries of the pact clearly features as a relatively minor preoccupation. Instead, much more attention is given over to the "growing concern of the member countries over environmental conservation in Amazonia" and the need to use the natural resources of the region in ways that are sustainable and that will contribute to raising the quality of life of the present inhabitants, while equally respecting the right of future generations to enjoy the same benefits.



## Xenophobic Backlash

How can Brazil's behaviour in the Amazon be consistent with the declaration of the meeting of foreign ministers in Quito? Brazil at present is the only country of the pact which is destroying its Amazon on a large scale, indeed to the point where it will take less than 30 years at current rates for all to have gone within a region encompassing 5 million hectares. Nothing in its policies indicates that Brazil is thinking again about its agro-industrial plans for the Amazon.

International criticism of Brazil has undoubtedly caused a backlash of xenophobia. Graffiti on the walls of the cathedral in Brasilia following the Altamira meeting (see *The Ecologist*, Vol. 19, No. 2) said it all: "The Amazon is ours: get out Ecologist Jews!" (*Folha de Sao Paulo*, 8 March).

But if such an extreme racism is not shared by the majority of Brazilians, it does pose a very real question: to whom does the Amazon really belong? Over the centuries Brazil, with all too little opposition from its neighbours, has pushed back its borders, ever encroaching on its Andean partners. Even this century, Brazil has won territorial concessions in the western Amazon from Colombia, as much as by default as for any other reason.

## Colombian Initiatives

Colombia, under President Barco, has now taken an unprecedented initiative with regard to the rights of indigenous peoples throughout its territory. In the Predio Putumayo region, some 8,500 indigenous peoples from the relics of a number of different communities which were decimated by enslavement, torture and massacre during the rubber boom early this century, have been given complete territorial rights over their land — some six million hectares. Such *resguardos*, as these regions are called in Colombia to distinguish them legally from reservations, now make up more than 12 million hectares in the Colombian Amazon, practically one third of the total Colombian Amazon area. The aim now is to get another six million hectares in the northeastern part of the Colombian Amazon, in the region of Guainia, also recognised as *resguardo* for the indigenous communities.

As President Barco pointed out when conferring the lands back to the Indians, "I bring you my greetings. I am coming to give you good news, a word of truth: at last your land is yours." He then went on to say: "With the handing over of the *resguardos* (we have made a) definite step in the execution of an Amazonian politics which recognises the rights of the aboriginal communities and seeks to establish a rational management, that is balanced and leads to a sustainable use of natural resources."

In Colombian law, the indigenous peoples who live in the *resguardos* not only hold the right to them as a community in perpetuity, but they have the right to maintain and develop their own cultures, using their own language for education and to manage their resources as they think fit. A motive in granting the communities such generous quantities of land is to ensure the sound environmental management of a region that has a richer flora and fauna than any other part of the globe, especially in Colombia, which in one million hectares of its Amazon has probably as many species as the entire Brazilian Amazon.

Indeed, in his preface to *Colombia Amazonica* (the National University of Colombia, Bogota, 1987), President Barco maintains that the various Amazonian countries should not make use

of the natural resources of the Amazon according to what they might deem to be their immediate needs and in isolation from the other states of the region. "On the contrary," he says, "Amazonia is a common patrimony that we must learn to manage jointly and for the future well-being of the continent and of all humanity." "We need to establish an Amazonian politics," he went on to say, "that unites the countries of South America, respecting the significance which the rest of the world holds for the conservation of the last great natural reserve."

In the spirit of a new perspective over the Amazon, Bolivia has now created a reservation encompassing some 4 million hectares for the Indians of the Beni region, and that without compromising itself in any debt-for-nature swap. Moreover, at the highest levels in Bolivia, the traditional land rights of the indigenous communities are fully recognised. Although it is outside the actual Amazon Basin, Ecuador and Colombia have established the first ever national park in South America to run over both borders, in an area which is the home of the Awa Indians.

## Waging War Against Nature

Surely the hope has to be that Brazil will ultimately, but not too late, respond to the initiatives now emerging from other countries with sovereignty over parts of Amazonia. Indeed, Colombia, with less than one-tenth the area of Amazonia that is under Brazilian sovereignty, has not only managed to preserve intact a considerable proportion of its forests, but remains determined to continue that preservation. And that is to be achieved through recognizing that the forest and its complex of rivers is best left in the hands of indigenous peoples who over the millennia are the only peoples in the Americas who have shown that they can live and use the natural environment without exploiting it to destruction. In fact, the evidence is mounting that they may have contributed to the richness and diversity of the forest ecosystem.

Brazil has to get away from the notion that its behaviour as a nation is somehow above criticism. Those environmentalists whom Brazil would like to shut up are also campaigning in their own countries for a clean, healthy environment, and are putting their lives at risk to stop the French testing their nuclear bombs in the Polynesian Pacific and the Japanese from continuing their butchery of whales in Antarctica.

We now have evidence that the Amazon forest contributes significantly to a stable global climate. The world has a right to be concerned that Brazil is showing insufficient responsibility in its management of a unique and major natural resource. Brazil at the present time is waging war against nature and on its own people who, unless there is a dramatic change of Brazilian policy towards the Amazon, in a generation will not inherit a green Persian Gulf, but a veritable Arabian desert.

Peter Bunyard



# Consuming Fashions?

## The Limits Of Green Consumerism

by  
Sandy Irvine

*'Green consumerism' may be a contradiction in terms but it has now become a powerful commercial force. The core of the green message — that we must consume less — is being submerged under a wave of advertising and publications urging us to save the world by simply consuming better. Individual actions are vitally important but not enough to avert the ecological crisis. There must be political and institutional change based on a sound understanding of the limits of growth and the concept of ecological sustainability.*

Public interest in individual lifestyle change and especially 'informed choice' in 'using the power of the purse' is burgeoning. Green consumerism has become a popular slogan. There is even talk of a new species — guppies (green yuppies). *The Green Consumer Guide* by John Elkington and Julia Hailes<sup>1</sup> rocketed to the top of Britain's best-selling paperbacks. Other publishers have also spotted the demand for such guides, most notably *The Blueprint For A Green Planet* by John Seymour and Herbert Girardet,<sup>2</sup> (see *The Ecologist*, Vol. 19, No. 1 and letter, this issue). *The Ethical Consumer* and *New Consumer* are greener rivals to the long-standing *Which?* magazine of the British Consumer Association, and a new pressure group, 'Ark' is to promote green products.

Many businesses in Britain, like the Body Shop, which stocks "cruelty-free" minimally-packaged and natural ingredient-based soaps and the like, have been riding high on the wave of green consumerism. The Body Shop itself has been expanding at the rate of 20 new outlets a year in the UK alone and was named "Company of the Year" at the 1987 Business Enterprise Awards. Many supermarkets have jumped on the bandwagon. The Tesco chain, for example, has adopted a "green label" scheme for its stores. Multinational corporations have been equally quick to sponsor wildlife reserves, hand out grants and otherwise boost their green image. Heinz and Ford parade themselves as protectors of the countryside. More generally, many adverts now use 'green' imagery and language to hawk their wares. *Green Pages*, for example, contains full-colour adverts from British Nuclear Fuels and Shell<sup>3</sup> (see box p. 89).

### The Limits of the Purse

All this is, at one level, very encouraging. In terms of a choice between green and ungreen consumerism, it is clear which variety anyone who cares about the future should support. Nevertheless, there are crucial limitations to the successes that this approach can achieve by itself. It is not just that it is wide open to being cynically hijacked by the established interests in business and politics. Rather, it is that the construction of a better

world requires a collective and political restructuring of our institutions. This in turn depends upon a clear diagnosis of what is wrong with society and what must be done to put it right.

### Green Consumerism Is Still ..... Consumerism

Responsible 'shopping around' fails to escape the logic and limitations of consumerism as a whole.<sup>4</sup> Human fulfilment is still defined largely in terms of the purchase of commodities. The Body Shop is certainly much more socially and environmentally enlightened than Boots The Chemist, but they both want you to fill out your bathroom with deodorants, perfumes and all the other paraphernalia of conspicuous consumption. Interestingly, Ted Trainer's survey of Australians leading lives of "voluntary simplicity" came to the conclusion that we could still "live comfortably on around one quarter of present per capita volume of commercial production" in which case "75 per cent of firms would go bankrupt". He rightly points out that we need a totally different kind of economy.<sup>5</sup>

### Social Responsibility

Green consumerism also begs crucial questions about the organisational form through which goods and services are delivered, although John Elkington's praise for the environmental excellence of multinational corporations<sup>6</sup> is at odds with the sentiments of most other writers in the field. There is still a tendency to discuss issues such as personal health and education without reference to the continued cutbacks in institutions like the British welfare state and corresponding moves towards two-tier public/private systems closer to the American model. Problems of boredom and health hazards experienced by workers on the production lines of many 'green' products do not feature in checklists such as Elkington and Hailes' "key issues for the Green consumer".

The central thrust of green consumerism is the rejection at the shopping counter of 'flawed' goods and services in favour of more benign ones. However, in the absence of other changes, this risks merely substituting one type of hazard for another.<sup>7</sup>

Sandy Irvine is a lecturer and co-author of *A Green Manifesto* (Optima, 1988). He is a member of Gosforth Green Party in north-east England.



Many green consumers, for example, advocate natural materials instead of synthetics yet, at present levels of population and living standard expectations, this amounts to a switch from the resource depletion and pollution of oil production and processing to the hazards of cotton monoculture and large-scale sheep grazing.

Green consumer guides also discuss at length products from renewable sources. It is, of course, true that those resources based on solar energy and biological systems do replenish themselves, unlike the world's once and for all endowment of minerals. However, because of the diffuse and variable nature of solar energy sources and because of the physical, ecological and moral limits to what can be taken from populations of plants and animals, renewable resources cannot underwrite present human numbers and lifestyles. They only become appropriate in the context of a greatly scaled down society — which can only come about through structural changes to society through the exercise of political power.

There is in fact a considerable literature demonstrating that scientific fixes for social and environmental problems are more likely to multiply the problems than solve them. As Paul Ehrlich and John Holdren have memorably commented, "those that be-

lieve that science will pull a technological rabbit out of the hat to save us at the last minute suffer from an inability to learn. Technological rabbits...usually have large appetites and abundant noxious droppings."<sup>8</sup>

## From Shampoo to Champagne

Many leading advocates of green consumerism dodge the hard questions on the size of personal consumption patterns. The *Green Consumer Guide*, subtitled 'From Shampoo to Champagne', is quite careful to give the impression that we are not being asked to give up too much.

They are even more evasive on the other key factor in the ecological crisis — overpopulation. This is not just an issue for Third World countries. Overcrowded countries like England can only survive by drawing on the resources of other peoples and future generations, let alone of all those species now being driven into extinction because of the sheer pressure from humanity. Yet neither a single green consumer guide or magazine, nor the personal pledge of the Ark campaign, even mentions the importance of individual responsibility in this matter.

## The Cutting Edge of the Environment Industry

*The Green Capitalists: Industry's search for environmental excellence*, by John Elkington and Tom Burke (Gollancz, 1987) and *Green Pages: The business of saving the world*, by John Elkington, Tom Burke and Julia Hailes (Routledge, 1988) represent (to use the kind of language favoured by Elkington *et al.*) the 'cutting edge' of the new 'Environment Industry' and give us a good idea of what its 'proactive strategies' will be for pushing forward the 'frontiers of environmental science'.

*The Green Capitalists* tells us how praiseworthy some industries have been in incorporating environmental considerations into their product development. Rolls-Royce, for example, have managed to produce an aircraft engine that is cleaner, quieter and more fuel-efficient. Mercedes Benz got into catalytic converters before the EEC and ICI has developed a solvent for car paint that cuts emissions during the drying process by 85 per cent. Joseph T. Nolan, vice-president for public affairs at Monsanto believes that companies should ask: "What do activist proponents of change want to bring about? What societal trends or organizing strategies are likely to help or hinder them in their pursuit? What if they succeed? How would that affect my company's products, or markets or finances?"

It seems that in order to find the answers to these questions, Monsanto (and other companies) hired John Elkington who came up with the answer that the best defence (against environmental protectors) is attack. By becoming world leaders in the development of less-polluting car paint not only are there large profits to be made, but the fundamental question about whether we should be hurtling around in cars in the first place drops down the agenda.

Elkington has totally dodged the difficult issues — like the weapons industry or how to get an environmentally-painted car to each of the citizens of sub-saharan Africa, even if this were desirable. ICI group environmental adviser Mike Flux seems to understand the contradictory interests at stake rather better: "People talk of sustainable development but it's a difficult message to sell to industry. There's an inherent conflict in time-scales...The facts are that most people in industry operate on a two year time-span."

### Building Bridges

In *The Green Capitalists*, Elkington makes it clear that his objective is to "build bridges" between environmentalists and big business. *Green Pages*, a comprehensive collection

of articles and features from industry and the Green movement, was the next step in his crusade. Contributions by Lester Brown and Petra Kelly sit uncomfortably with advertisements praising the environmental excellence of British Nuclear Fuels and Shell.

### Green Pygmies

There has never been any way the Green movement can compete with big business because it has no control over the rules of the game. The Green Party cannot out-advertise Shell and BNFL. Furthermore, in the face of the hopeful enthusiasm surrounding the Green Consumer movement, pointing out that the Environment Industry is a confidence trick and that people should be consuming *less* and not just consuming *differently*, will certainly be viewed as sour grapes. In the words of Peter King of Britain's Society of Chemical Industry, people who advocate less consumption will be seen as "green pygmies...the flat earth society". Indeed, whatever Elkington's motives might have been at the outset, he has not so much turned confrontation into cooperation by his "bridge-building" exercise as delivered the Green movement into the lap of the industrialist.

Sara Parkin



## Sustainable Development?

Underlying the current Green Consumer boom is the idea that, with careful housekeeping, we can somehow have our cake and eat it — that, in fact, we can have growth that is sustainable. Indeed, the word 'sustainability' pops up these days in one official report after another. It is now even being used as an argument for such environmentally and socially inappropriate technologies as nuclear fusion, large-scale wind turbines, solar power 'towers', megadams, food irradiation and recombinant genetic engineering.

However, in a finite, ecologically interconnected and entropy-bound world, belief in sustainable growth is no different to a belief in perpetual motion. *Sustainable growth is a contradiction in terms.* In practice, 'sustainable' production has been responsible for displacement of human communities, intolerable health hazards, much cruelty to animals, and destruction of other species in general.

'Sustainability' is too easily equated with efficiency in terms of production of this or that resource for purely human material needs and often merely private profit. The 'scientific management' of America's forests, for example, justified the replacement of old woods by uniform 'tree factories' in which toxic spraying has threatened wildlife and humans alike. The same story is repeating itself in the destructive and cruel fish farms 'blossoming' around Scotland. It can be seen in all those National Parks which have been increasingly yoked to a new production industry — mass, organised leisure — to the detriment of the very things that they were intended to preserve. Lands belonging to local peoples and local species have often been drowned to provide 'sustainable' hydroelectricity.

It is tempting to see the problem purely in terms of human-made restrictions on production which only have to be released to usher in a world of material abundance (a view promoted by the socialist tradition and, to a lesser extent, by the mis-named 'Social Ecology' school, the dean of which is Murray Bookchin). However, the truth of the matter is that global society is now in a general state of overdevelopment. Paul and Anne Ehrlich, for example, have estimated that already "our one species has co-opted or destroyed some 40 per cent of potential terrestrial productivity."<sup>9</sup>

It is, of course, difficult to put any hard figures on what is the optimum size of human society. Supported by a mass of argument and evidence, William Ophuls argues that ecological sustainability would mean a world population closer to one billion living at current Norwegian standards of personal consumption.<sup>10</sup> The grinding poverty now experienced by an estimated one billion people across the 'Third World', also puts a question mark over the green champagne for all promised by Elkington and Hailes.

## Green Producers, Consumers and the Growth Economy

The most important driving force behind our environmental crisis is the sheer size of the throughput of energy and materials through the economy. Given our present economic structures, individual producers are put under pressure to expand or go under. Even if their produce is based on renewable resources and less polluting production processes, businesses enterprises are locked into a spiral of overdevelopment that is colliding with the



*Environmental pollution is more than just a question of litter, but corporate sponsorship allows companies responsible for massive waste, poor nutrition and other environmental problems to buy a 'respectable' public image.*

rhythms, tolerances and capacities of the environmental systems on which all life depends.

Not only is the total human economy overgrown, so too are its institutional components, not least business enterprises. Because of this they are able to manipulate the consumer to their own advantage and frustrate attempts to make them serve the needs of local communities and local environments. The production and retailing of environment-friendly produce does not make a transnationally owned factory or a High Street chain store any more democratic or responsive. Profits are still repatriated outside the local community while local branches are first to be closed when the remote headquarters decides to cut back on its activities.

In fact, talk of 'sunrise industries' paints as false a picture of the modern economy as does the fashionable concept of 'post-Fordism'. It too conjures up a seductive image of decentralised, flexible businesses responding to consumer pressure for more quality and more choice. In reality, in all the key sectors of the economy, economic giantism is still the order of the day. The car, chemical, food and electronics conglomerates are still very much in command. The trend is not towards diversity but towards concentration of ownership and more hierarchy. Mass production techniques have spread from factory to farm. Competition is cut-throat as Japanese, American and European corporations fight to control the world market. Walk past shop windows in any industrial country and you will see the same products. Elkington and Hailes' "green tourists" are able to wash down their Kentucky Fried Chicken with Coca-Cola while walking the streets of Beijing.



# The Unacceptable Face of Environmentalism

Sponsorship of environmental causes has long been recognised as 'good public relations'. The multinational giant Shell has sponsored many 'green' competitions and organisations while manufacturing the notorious organochlorine pesticides Aldrin and Dieldrin.

Aldrin and Dieldrin are persistent for up to 25 years in a temperate environment. Aldrin was used for controlling wireworm in seed potatoes; as a control for vine weevil on pot plants; on daffodil bulbs to control narcissus fly. In practice it has also been used as a multi-purpose agricultural pesticide, ranging from sheep dip to seed dressings. Dieldrin is used in wood preservatives.

Since 1986, Shell have been the sole manufacturers of these chemicals. Manufacture of Dieldrin ceased in 1987, but Aldrin is still being produced. In 1986, 30 tons of Dieldrin and 40 tons of Aldrin were sold in the UK. About five tons of Aldrin are believed to be 'in the market' in Britain, but Shell refuse to accept recommendations that they should buy it back, despite continuing pressure from Friends of the Earth and other environmental groups.

## Decline in Predator Populations

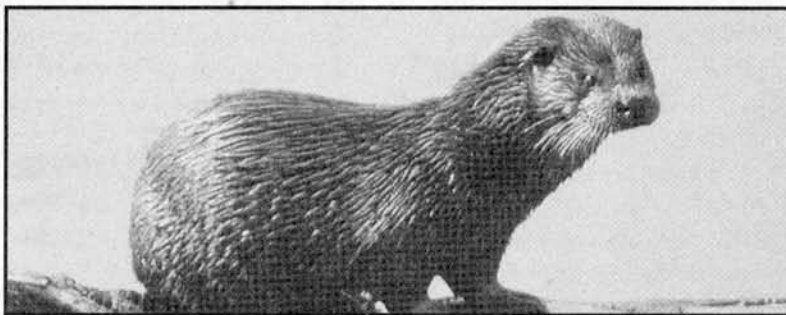
Dieldrin is found in the environment in the flesh of fish and predatory animals and birds. It has been found in very high concentrations in eels — an important food for otters, herons and bitterns. Aldrin is marginally less toxic but decays to Dieldrin in the environment. Dieldrin is present in ground water, and also occurs in the sewage sludge produced in water treatment plants, which may be spread on farmland as a fertiliser or dumped in the sea.

Researchers have shown a direct correlation between the spatial and temporal introduction of Dieldrin, Aldrin and another organochlorine pesticide, Heptachlor (see *The Ecologist*, Vol. 19, No. 1) as cereal seed dressings against wheat bulb fly, and a dramatic drop in otter sightings in Britain in the late 1950s. High

concentrations of these chemicals were found in the bodies of dead otters. The effects of poisoning by Dieldrin are in any case characteristic, causing contraction of the spinal muscles so the corpse is bent into a comma shape.

Studies of other predator groups have reached similar conclusions on the involvement of Aldrin and Dieldrin in population declines. In *British Birds: 1966*, by Dr. Jeffries and Ian Prestt, there appears this laconic comment, on the subject of dead hawks: "DDT was affecting them sublethally, but Dieldrin killed them."

Although Aldrin and Dieldrin are now to be banned in the EEC, Aldrin is still being sold by Shell to Third World countries such as Nigeria and Zambia, where it is used officially for termite control. However, in view of



the lack of regulatory control in most Third World countries and their general lack of alternative pesticides, there is good reason to believe that once Aldrin has passed into the distribution chain in the countries concerned its use is not restricted to killing termites. In any case, termites are at the base of many food chains in Africa.

## Shell's Better Britain

Shell have been active supporters of environmental campaigns for many years and they apparently make no pretence that their motivation for doing so is altruistic. A Shell press briefing document states; "Shell UK's concern for the environment in which it operates is not new. Its interest goes back 50 years to the commissioning of pictures from up-and-coming young artists for advertisements showing the beauty of Britain's countryside, and the launch of the Shell County

Guides...The primary objective of all this was strictly business. It succeeded, helping Shell UK to become one of Britain's largest companies, but at the same time was born the company's concern for environmental matters which is reflected today in campaigns like the Shell Better Britain Campaign."

## Green Gloss

Shell have been leaders of the trend amongst major companies towards adding 'green gloss' to their image. The list of activities involved is lengthy, but makes strange reading in some cases with the knowledge of what their products Aldrin and Dieldrin were doing at the same time to wildlife generally and Britain's limited number of predatory mammals and birds in particular.

In the late 1970s, Shell introduced Village Venture competitions, intended to "encourage communities to become involved in voluntary projects to improve the quality of rural life." During European Year of the

Environment, they participated in such campaigns such as Waste Watch and Brightsite (which actually had the aim of helping small companies clean up their own act!). They also took part in the Pollution Abatement Fair and Conference with the stated objective of demonstrating "the importance attached to the protection and conservation of the environment in which we work."

It is not suggested that Shell are alone in producing and marketing substances with toxic side effects with one hand, and participating in environmental activities with the other. Most major multinational manufacturing companies have records which do not stand close scrutiny in this respect. Shell's record has been used as an example only because it is so well documented and the contradictions so obvious.

Robin Murrell

The above is an edited version of an article which first appeared in *Environment Now* magazine and is reprinted with their kind permission.

## Advertising: Massaging the Message Of More

The modern advertising industry provides the crucial link between mass production and mass consumption. It is big business with a vengeance, bombarding us daily with messages about every area of life. The public images of leading politicians are as carefully managed as those of toilet cleansers, and as accurate.

The least of the advertising industry's costs are the direct financial ones, many of which are, of course, passed onto the public. In addition there is the sheer imbalance in access to the 'means of persuasion'. The management of public opinion and consumer spending is monopolised by and for the benefit of those with the most money. What makes advertising dangerous is that the communication is not about actual facts and figures with which fault can be found, but the much more subtle weaving of seductive images around a product or an institution (the CEEB for example).

The very dynamic of advertising multiplies the social and ecological disruptions caused by mass industrialism. It seeks to exploit our hopes and fears by harnessing them to the purchase of this or that commodity. Modern ideas about marketing proceeded hand-in-hand with the innovations in production by Henry Ford and his kind. Both depend on discouraging self-reliance on one's own resources and judgement, and on encouraging weakness and dependence. Advertising is based upon the creation and maintenance of a state of unease and dissatisfaction. Who we are and what we own become blurred together in an unreal world of style, fashion and image.

Advertising encourages every form of waste, from unnecessary model changes to gimmicks to differentiate identical products. Its paraphernalia disfigure townscapes and landscapes. Its bottom line can only be more environmental destruction. This in turn can become a marketing opportunity as the consequent scarcity of what many communities had to hand — open space, wildlife, clean streams — creates a chance to market what still survives or to hawk technological substitutes.

## Corporate Greed and Government Regulation

Enlightened consumerism is therefore fundamentally constrained by the nature of the society in which we live. This raises questions about power and vested interests in society. Yet in the writings of John Elkington *et al*, our problems seem to be the consequence of some big misunderstanding or oversight which a few management training seminars can put right.

In fact, many promising initiatives have been stifled by corporate greed, government regulations, land ownership patterns, taxes and subsidies that discriminate against them. Moreover, many wasteful and polluting goods are alluringly cheap simply because they do not incorporate the full costs of their production, passing them on to the environment at large. Only the exercise of governmental power can remedy this. Similarly, without such protection, green consumerism will also provide a golden opportunity for the unscrupulous to cash in on public concerns. Low alcohol lager, for example, which incurs no duty, costs more than the real thing. We are charged more for unsliced wholemeal bread, which has not been expensively refined, than for its sliced white imitation.

## Limits To Individual Decision-Making

However, the most fundamental case for a collective approach is the way in which what is individually and what is publicly rational can diverge.<sup>11</sup> Green consumerism still embodies much of the mythology of the sovereign consumer, supposedly the economic equivalent of the voter at the ballot box. Even if the green consumer has all day to go from one store to another, checking prices and labels, it is still often very difficult to know which is the 'best buy'. It is far from easy to know where products have originally come from, what has gone into them, how long they will last etc.

More generally, the short-term disadvantages of collectively appropriate changes in lifestyle often outweigh personal benefits. For example, a household which buys expensive waterway-friendly washing powders from the socially-friendly wholefood shop round the corner is out of pocket compared to its neighbours who are destroying lakes, seas and rivers with the phosphates contained in the cheap supermarket brands. Individual acts of responsibility might make one feel good but are otherwise futile if most other people continue to behave irresponsibly.

It is not surprising therefore that many of our long-term problems are caused by the cumulative consequence of all those little decisions we make, so insignificant in themselves but so disastrous in total. The long-term price is resource depletion, pollution and environmental degradation. Any answer to these problems must start from a recognition of just how difficult it is for individuals to take account of this dynamic of collective ruin in their daily decisions, especially in the anonymous mass society of industrialism. We need social institutions that act as the custodian of the collective conscience, and must not just put our eggs in the basket of individual self-transformation.

## Changing the Institutional Framework

What is necessary is not just a private, but also a collective approach in which society sets down appropriate parameters for technological choice and economic activity.<sup>12</sup> Political decisions are necessary to set the outside limits within which market mechanisms can operate. Contrary to left versus right-wing arguments, it is not simply a question of either state planning or free market but of creating an ecological framework to guide the overall economy. Within this, it is a matter of what is most appropriate — public or private provision, individual or collective enterprise. Water supply, for example, is best kept in public hands so essential is its provision and so far-reaching its ramifications; the supply of shirts on the other hand is better left to private initiative and creativity. In both cases, however, it would be important to restrain the size of the organisation just as it is vital to restrain the size of the total economy.

Green economic institutions will be based on the rules of true good housekeeping, those of the Earth. Garrett Hardin puts the issue squarely. "In a world of limits we can become wealthy only if we subject ourselves to the discipline of demand control ... Confronted with a painful discrepancy between supply and demand, the prisoners of a squanderarchy invariable speak of a shortage of supply. Why do they never speak of a longage of demand ... To speak of 'shortage' is to predispose the mind to only look for ways to increase supply. By speaking of 'longage' we force our minds to consider the possibility of decreasing demand."<sup>13</sup>



The institutions to achieve the necessary balance are those of the steady-state economy. They will regulate the scale of economic activity as well as provide much of the revenue necessary for expenditures by a Green government. The main economic tools would be resource taxes (though they could take the alternative form of depletion quota auctions as proposed by American economist Herman Daly). Others include:

- the Community Ground Rent, primarily designed to discourage speculation over land whose use would be guided by the kind of ecological planning pioneered by planning theorists such as Ian McHarg;<sup>14</sup>
- a progressive tax on all income;
- a progressive turnover tax on companies (to encourage smaller businesses);
- selective purchase taxes on luxury goods.

The continuous thread that links all these measures is the shift of the burden of revenue-raising away from activities such as recycling and repair work to the discouragement of excessive use (and waste) of energy and raw materials in the economy. Such policies are based on Jeremy Rifkin's words: "The most important truth about ourselves, our artifacts and our civilisation is that it is all borrowed... We are forever borrowing from the environment to create and maintain the totality of our way of life. Everything we transform eventually ends up back in Nature after we have expropriated whatever temporary value we can from it."<sup>15</sup> Unlike the models of Adam Smith and his descendants, such insights point us to the task of maintaining the *real* wealth of nations. These measures may be scorned by those trapped within traditional frameworks but if we care about our future there must be a willingness to implement successfully a package along such lines.

Devolution can begin to cure the same affliction of giantism in our political and welfare institutions. Developments such as the 1992 Single European Market will otherwise destroy local communities and environments alike (as can be seen from both the Common Agricultural Policy and the integrated Mediterranean Programme).

Collectively organised schemes for Basic Guaranteed Income/Social Dividend are also vital. Without such measures, the mass of people will cling to jobs based on social and environmental destruction. Moreover, much of what Schumacher and others have called 'good work' consists of a mass of bits and pieces which cannot form the basis of full-time, permanent employment and which will not get done without a social restructuring of how we find our livelihoods.<sup>16</sup>

Another precondition for a real greening of society that depends upon political action is an opening up of all those secret doors behind which information about the composition of products, expected lifetimes and so forth is locked away from public scrutiny. Similarly, decision-making processes in the corridors of government and the boardrooms of business need to be made more visible and accountable to the people whose lives they affect.

Most importantly, we must address the really significant questions — why do we want these resources? What is the good life? What kind of use for whose benefit to what level? What is the right relationship with the rest of nature? and so forth — questions left begging on the bandwagon of green consumerism.

Only the holistic perspective of the 'Deep Greens' provides both an adequate definition of and policies for ecological sustainability.

*We need to think in terms of the sustainable and balanced satisfaction of different kinds of present and future human needs —*

*material, psychological and spiritual — and those of other species.* This is true ecological sustainability. We would not try to satisfy the aspirations of one community, culture or generation by sacrificing another. We would not strive to fulfil human wants by destroying other species. Within this framework we can begin to devise lasting ways of supplying the needs of a truly worthwhile society.

Ecological sustainability is a potent concept if set in the context of the limits to growth and the rights of both future generations and other species. If not, it will be a cloak for yet more manipulation and exploitation.

## References.

1. J. Elkington and J. Hailes, *The Green Consumer Guide*, Gollancz, London, 1988.
2. J. Seymour and H. Girardet *Blueprint For A Green Planet*, Dorling Kindersley, 1988.
3. J. Elkington, J. Hailes and T. Burke, *Green Pages: The Business Of Saving The World*, Routledge, 1988.
4. William Leiss, *The Limits To Satisfaction*, Marion Boyars, 1978. Fred Hirsch, *The Social Limits To Growth*, RKP, 1978. Tibor Scitovsky, *The Joyless Economy*, OUP, 1976. S. and E. Ewens, *Channels Of Desire*, McGraw Hill, 1982.
5. T. Trainer, 'How Cheaply Can We Live', *Ekistics* 304 Jan/Feb 1984, 61-65.
6. J. Elkington and T. Burke, *The Green Capitalists: Industry's Search For Environmental Excellence*, Gollancz, 1987.
7. Paul Ehrlich and John Holdren, 'One-dimensional Ecology', *The Ecologist*, Vol. 2, No. 2, 1972, 11-21.
8. Paul Ehrlich and John Holdren, 'Eight Thousand Million By the Year 2010', *The Ecologist*, Vol. 6, No. 4, 1976. See also: William Ophuls, *Ecology And The Politics Of Scarcity*, Freeman, 1977. Eugene Schwartz, *Overskill*, Ballantine, 1971. Jeremy Rifkin, *Declarations Of A Heretic*, RKP, 1985. Gunther Stent, *The Paradox Of Progress*, Freeman, 1978. John Holdren, 'Technology, Environment And Well-being', in C. Cooper (ed.) *Growth In America*, Westview, 1976, and especially the works of N. Georgescu-Roegen.
9. Paul and Anne Ehrlich, *Earth*, Thames Methuen, 1987. See also: F. E. Trainer, *Abandon Affluence*, Zed, 1985.
10. W. Ophuls, op. cit., supra 8.
11. I hope I do not offend Garrett Hardin if I say that the best exposition of the "Tragedy of the Commons" problem is by William Ophuls, op. cit., supra 8. It is, however, important to draw attention to its Hobbesian weaknesses as noted in 'Leviathan, The Open Society And The Crisis Of Ecology', by David Orr and Stuart Hill in D. Orr and M. Sorroos (ed) *The Global Predicament*, Univ of N. Carolina Pr, 1979. See also: A. E. Kahn, 'Tyranny Of Small Decisions', *Kyklos* 1, 1968, 23-47. T. C. Schelling, 'On The Ecology Of Micromotives', *The Public Interest*, 25 1971, 59-98.
12. C. A. Hooker and R. van Hulst, 'Institutionalising A High Quality Conserver Society', *Alternatives* 9, 1980, 25-36. Herman Daly, *Steady-state Economics*, Freeman, 1977. H. Daly (ed.), *Economics, Ecology, Ethics*, Freeman, 1980. The best collection of articles on the same theme: W. E. Westman and R. M. Gifford, 'Environmental Impact: Controlling The Overall Level', *Science* 181, 31, Aug 1973, 819-825. Donella Meadows, 'Equity, The Free Market, And The sustainable State' in D. Meadows (ed.), *Alternatives To Growth* 1, Ballinger, 1977. M. Sagoff, 'At The Shrine Of Our Lady Fatima, Or Why Political Questions Are Not All Economic' reprinted in T. Regan (ed.), *Earthbound*, Temple Univ, Pr, 1984.
13. G. Hardin, 'Ending the Squanderarchy', in *Naked Emperors*, Kaufmann, 1982.
14. I. McHarg, *Design with Nature*, Doubleday, 1969.
15. J. Rifkin, op. cit., supra 8.
16. A general presentation of these issues can be found in Sandy Irvine and Alec Ponton, *A Green Manifesto*, Optima, 1988. See also Herman Daly's various writings and: Green Party Economics Working Group briefs on 'Taxation', 'Money And Debt' And 'Community Ground Rent' D. Weston, 'Green Economics — The Community Use Of Currency', paper to The Other Economic Summit, London, 1985. Green Party, *Working to Live.: A Green Approach to Work and Employment*, London, 1988. Warren Johnson, *The Guaranteed Income As An Environmental Measure In Economic Growth Versus The Environment*, Wadsworth, 1971. A. Miller, 'The Economic Implications Of Basic Income Schemes', paper to The Other Economic Summit, London, 1984.

# Pesticide Residues: The Scandal Continues

by  
Peter Snell

*Despite official assurances, Britain's food continues to be contaminated with high levels of pesticides, many of them proven health hazards. Monitoring is inadequate, many pesticides which have been banned continue to be used, and pesticides which are set to be withdrawn in the US on safety grounds are not even being reassessed in Britain. Leaked documents show increasing concern among officials within the Ministry of Agriculture, but their warnings have gone unheeded.*

Concern over the possible effects of 'Alar' (chemical name; daminozide) residues on the health of children have recently led the US Environmental Protection Agency (EPA) to move to ban its use in the United States. As a result, concern about pesticide residues in food has once again become front-page news in Britain.

Daminozide acts as a growth promoter by slowing the growth of leaves and branches and thus forcing an increase in budding and fruit production on those apples on which it is sprayed. Seven per cent of the British apples crop is treated in this way. In the US, there is particular concern about UDMH, a breakdown product formed when daminozide is heated. In a recent study of the potential of pesticides to cause cancer, the Natural Resources Defense Council (*see box*) concluded that daminozide was the most potent of the commonly used pesticides in the US. In Britain, by contrast, the chemical does not even feature amongst those whose safety is currently being reviewed by government.

## MAFF Complacency

Not for the first time, the Ministry of Agriculture, Fisheries and Food (MAFF) has been caught napping. In 1986, the House of Commons' Select Committee on Agriculture questioned MAFF about its failure

to obtain toxicity data on dinoseb, soon after it was banned for safety reasons in the US. MAFF's response was to claim that such data was unobtainable — only to be told that the Select Committee had obtained it two weeks previously.

As a result of this and similar gaffs, the report of the Committee's inquiry into the effects of pesticides on human health was extremely critical of MAFF's complacency, and of the inadequacy of current British controls over pesticide use. Because the general election intervened before the Select Committee had completed its work, the report had to be based on the chairman's report on the committee's conclusions at the end of each sitting. The report is thus widely referred to as the "Body Report", after Sir Richard Body MP, who chaired the sessions.

On the issue of residues, the Body Report stated that there was significant current misuse, that current levels of monitoring were inadequate, that improved analytical methods for residue analysis were needed, and that excessive residues should be traced back to source to ensure compliance with usage instructions. Overall, the report concluded that "a more open system of accountability is an essential part of the evolution of a regulatory system designed to inspire public confidence at home."

## Questionable Reassurances

The *Report of the Working Party on Pesticide Residues* is published every four years. It is a compilation of the results of all the residue testing conducted on behalf of central government over the previous four

years. It is therefore the most comprehensive published survey of pesticide residues in our diet. The latest edition was published in March 1989 and covers the period from 1985 to 1988. It therefore offers us our best insight into how MAFF has responded to increasing public disquiet about the potential dangers of pesticide residues in food.

The report has been seen by its sponsors, MAFF, as an opportunity to reassure those of us who worry about contaminants in our diets. Since the previous residues report was published before the report of the Select Committee, comparison of the two reports is a valid way of estimating whether MAFF has acknowledged that there are real causes for concern.

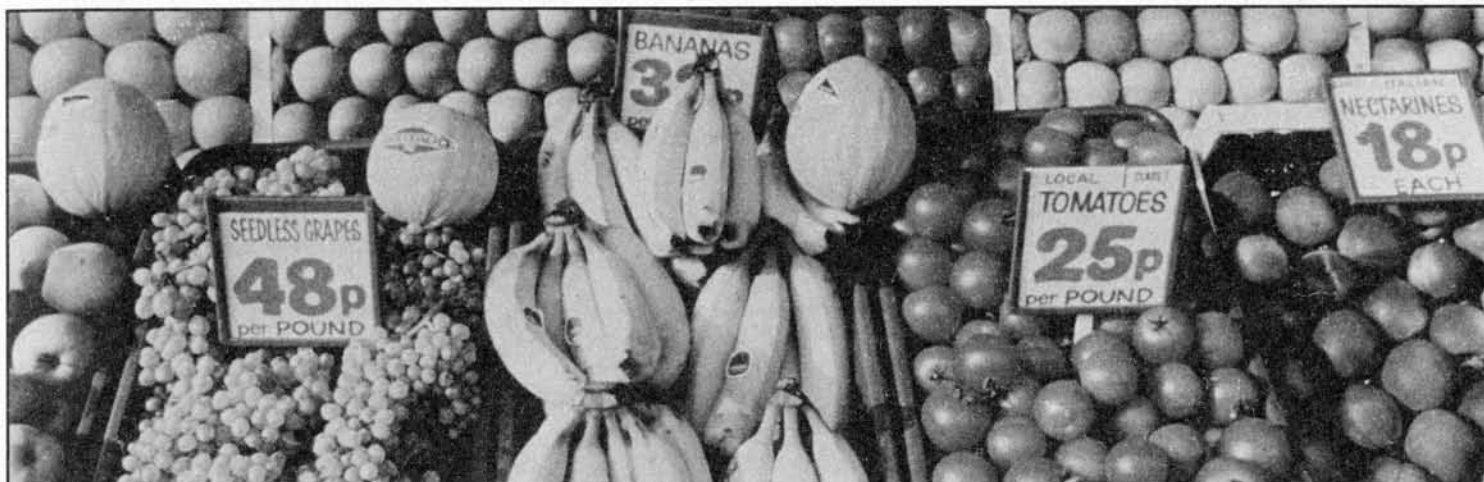
The press release which accompanied the previous report was a fine example of an attempt to provide reassurance about pesticide residues — whatever the reality. It claimed that the report was broadly reassuring and based this claim on the finding that residues of a number of organochlorines, which had been banned or restricted some years earlier, were finally starting to decline. It failed to mention that:

- Residue levels of DDT showed it was still in use in spite of being banned;
- 43 per cent of fruit and vegetable samples contained detectable residues and 29 per cent had residues at levels in excess of the Maximum Residue Limit (MRL). The MRL is an internationally agreed standard which represents the highest levels which should be present if a pesticide is used in accordance with usage instructions. In one case, the residue level was almost 20 times the MRL.
- Breast-fed babies could exceed the

---

**Peter Snell** is a research associate on pesticide issues for the London Food Commission. He also works as a freelance consultant in food law and food economics. He is co-author of *Food Adulteration and How to Beat it*, produced by the London Food Commission and published by Unwin Hyman Ltd. His address is: 26, Fassett Square, London E8 1DQ.





A frequent excuse for inaction over pesticide residues in food has been to claim that residues are present at such low levels that they are unlikely to be harmful. This does not however stand up to scientific scrutiny. There is a substantial body of medical opinion which believes that since cancer is caused at the level of the individual cell, there is no safe level for a carcinogen. (Photo: ICCE)

World Health Organisation's Acceptable Daily Intake (ADI) level for the banned pesticide DDT through the contamination present in their mother's milk;

- All samples of imports of processed rabbit and pork from China contained detectable residues of a technical grade of Lindane which has never been cleared for use in Britain because of its toxicity.

The latest report again claims to provide "a reassuring overall picture" — proof, if any were needed, that MAFF press releases lack originality. For, in reality, little has changed in the four years since the last report appeared. Thus:

- Levels of DDT residues demonstrate that its illegal use has continued;
- No continuous study of residue levels on fresh fruit and vegetables has been conducted, even though it is widely recognized that it is on fresh products, such as fruit and vegetables, that one is more likely to find the highest levels of the more modern chemicals such as organophosphates, carbamates and pyrethroids;
- Babies are just as likely to exceed WHO Acceptable Daily Intake limits for organochlorines if they drink baby milk prepared from cows' milk as if they suckle at their mother's breast;
- Processed meats from China still contain technical grades of Lindane in spite of discussions with the Chinese government seeking to prevent such contaminated food from entering the British food market — four years after talks were first initiated.

In both editions of the Report, the self-congratulatory tone only changes when one reaches the Appendix contributed by the Committee on Toxicity, which is sponsored by the Ministry of Health. In the

1985 report, the Committee noted the high DDT levels in the limited sample of breast milk which had been analysed and called for more samples to be tested. This advice was ignored by the Working Party. It is repeated in the latest report, together with calls for greater urgency in reducing exposure for groups with a consistent intake of extreme amounts of those foods with the highest residue levels. Such groups include children and the Chinese community. We will have to await publication of the next Working Party Report to see if MAFF takes any more notice of the Ministry of Health than they did last time around.

### Potent Health Hazards

The apparent lack of any real sense of concern about residues is particularly worrying in the face of growing public unease about the effects of pesticides. This unease is well-founded. Many groups of *insecticides* are effective through their action on the nervous system of insects and so it is no surprise that they can often kill humans through a similar effect if ingested at a high enough dose. More insidious are the possible long-term effects. *Growth regulators* and many *herbicides* dramatically alter growth rates at the level of the individual cell. It is therefore not surprising that many are linked with cancer in experiments on animals. The final large group of pesticides, *fungicides*, poses similar problems. A recent US survey calculated that 90 per cent, by weight, of the fungicides used in the United States had been linked with cancer.

My own review of the scientific data on the toxicity of pesticides, which was by no means exhaustive, revealed that, in Britain, of the 426 products on the Cleared

Product List in 1985, 68 were possible carcinogens, 61 were possible mutagens, and thus able to cause changes in the genetic material of cells, and 35 had been linked with reproductive effects ranging from miscarriages to birth defects. In addition, there were a further 93 known irritants, some of which were able to provoke quite disabling forms of dermatitis. In all, 40 per cent of approved British pesticides had been linked with one or more of these effects.

### Low Level Exposure

A frequent excuse for inaction by government officials has been to claim that residues are present at such low levels that they are unlikely to be harmful. This does not however stand up to scientific scrutiny. There is a substantial body of medical opinion which believes that since cancer is caused at the level of the individual cell, there is no safe level for a carcinogen. In addition, the incidence of intolerance of extremely low levels of pesticides, commonly described as 'allergy', has received wide publicity. It is extremely difficult to prove a direct cause-and-effect relationship in such cases because of the extremely wide variety of possible causative agents. However, there is increasing evidence of the disabling effects of pesticide sensitivity on a number of people.

Even if low levels were *not* dangerous, MAFF can no longer claim that residues are only present at low levels. Its own surveys reveal residue levels above the MRL. Indeed, a recent annual report of the Association of Public Analysts, whose members conduct much of the analysis for the government, stated that 1.3 per cent of the products they tested had residue levels

---

*"Of the 426 products on the Cleared Product List in 1985, 68 were possible carcinogens, 61 were possible mutagens and 35 had been linked with reproductive effects ranging from miscarriages to birth defects. In addition, there were a further 93 known irritants. In all, 40 per cent of approved British pesticides had been linked with one or more of these effects."*

---

in excess of the MRL.

## **Lack of Control**

The relatively high incidence of abuse which these figures reveal is indicative of the low level of control exercised over pesticide use in Britain. The Agricultural Select Committee was told that some farms are only visited by an Agricultural Inspector of Health and Safety Executive once every 30 years. On average, they would be visited once every 12 years — but this would include visits following reported incidents and so random inspections would in fact be less frequent. The Food and Environment Protection Act (1985) was the first legislation to give legal status to rules governing pesticide use in Britain. During its passage through parliament, the government had promised to increase the number of agricultural inspectors by 12 once the Act had become law. They subsequently reneged on this promise.

The Working Party seems finally to have accepted that abuse of pesticides is a reality and that without statutory backing for MRLs, the authorities are powerless to take action to stop it. The levels of residues clearly indicate that some users take no notice of bans on the use of particular chemicals or disobey the usage instruc-

tions by using too much of a chemical or by using it too close to harvest.

In previous reports, the Working Party has argued against laws to penalize producers whose produce has residue limits which exceed MRLs, the argument being that it was better able to encourage good practice through persuasion than through taking legal action.

Now that it has been forced to introduce statutory MRLs by the EEC, MAFF is quite willing to admit that it has lacked effective powers of persuasion without legal penalties. However, it is likely that successful prosecution of offenders will still be hampered by the difficulty of defining when a farm product becomes food. Unfortunately for consumers, MAFF's concern to be fair to producers means that many of the laws it prepares are extremely difficult to enforce.

## **Misleading Reporting Procedures**

On the plus side, the latest report is also far more open than previous editions in reporting just how many residues could be detected by the various test methods used. The number of residues detected by a single test has increased dramatically and cynics might suggest that it is for this reason alone that MAFF is now prepared to come clean on how many residues could actually be detected by the tests it uses. No matter. In a field shrouded in secrecy, any advance should be welcomed.

But the attempt to confuse persists — an example being the reporting of results on the basis of "pesticide/residue combinations" tested. This presentation of information can only be designed to mislead and needs some explaining. A typical section of the report might read: "One thousand pesticide/product combinations were tested and residues found in only 10 per cent of cases." Reassuring? No. In an extreme case, this could mean that 10 products were tested for 100 residues and every single one was found to contain a detectable residue. The purpose of such spurious 'statistics' is as clear as their actual mean-

ing is obscure. They fail to indicate how many chemicals were present in each product, how many products had residues present and which specific pesticide/product combinations were likely to appear given the use to which individual pesticides are put. These statistics can only mislead the uninformed reader and should be dropped.

## **Voices in the Wilderness**

Whatever the public pretence maintained by the report, we do actually know that MAFF officials directly involved in preparing the report are seriously concerned about various aspects of pesticide residues in the British diet. The chairman and two other members of the Working Party, Dr. P. I. Stanley, Mr. T. J. Coomes and Mr. F. B. Fishwick, were also on the Research Consultative Committee Residues Sub-Group, whose report was leaked to Friends of the Earth in 1988. Among other concerns, the Sub-Group was worried about the "bucket and shovel" techniques used to apply pesticides. It noted that the "inert" ingredients of pesticide formulations were often in fact toxic, and expressed concern over a number of inadequacies in current residue testing for both pesticides and their breakdown products.

Since then, a research review, sponsored by the Home-Grown Cereals Authority, has again included Mr. Fishwick among its members. It concluded that methods of residue analysis were inadequate in a number of areas; that there was inadequate data on residues on a number of commonly used pesticides in grain; that knowledge of the inter-reaction and breakdown of pesticides and food constituents was inadequate; and that new methods of food processing should be sought which increased the rate of breakdown of residues.

The information contained in these two reports is surely what we should expect in the formal report of the Working Party on Pesticide Residues if it were *seriously* seeking to inform the current debate on the level of public health protection in Britain. The *Salmonella* saga has demonstrated

**Remember  
to  
Subscribe to  
*The Ecologist***

See inside front cover or  
Wadebridge Ecological  
Centre leaflet for details.



that the public and their MPs are deeply suspicious of MAFF officials who simply cover-up for the inadequacies of Britain's Public Health laws. At best, they are seen as unconcerned bureaucrats. At worst, they stand accused of covering-up for the agrochemical industry.

## Conflict of Interest

Critics of the closed nature of agricultural control in Britain have long suggested that the role of MAFF in both overseeing pesticide safety and promoting increased food production must lead to a conflict of interests. They point out that pesticides are the only poisonous chemicals approved for use in industry whose safety does not have to be approved by the Health and Safety Executive. They claim that this position compares unfavourably with that of the Environmental Protection Agency (EPA) in the US, which is charged with a clear duty to protect the environment and is unencumbered by any duty to consider other interests.

A study recently commissioned by the EPA from the National Research Council provides a model for reducing, if not eliminating, the risk of pesticides in our diet. By a comparison of risk and usage data, it was able to draw up a list of the most dangerous chemicals in use in US agriculture and to plot out a systematic route for reducing the overall risk to the US population. EPA moves to ban "Alar" are a typical example of this approach.

Both Britain and the US are currently reviewing past pesticide approvals to weed out those pesticides which were approved on the basis of data which would be considered inadequate by present-day standards. The EPA has over 100 staff working on the project and acknowledges that it will not be completed until well into the next century. MAFF has about six staff employed in this general area and officially claims that all is under control. The fact that "Alar" was not even amongst the pesticides under review in Britain shows how inadequate that control really is.

We should welcome the news that MAFF officials are concerned about the inadequacies of current residue testing. We should deplore the fact that we have to depend on leaked documents to find out about this. This is information that we need to understand the true status of public health protection in Britain today. It is the information we need to determine whether such protection is adequate. It ought to be in the Report of the Working Party.

## Intolerable Risks: Pesticides in Children's Food

A recent report from the US Natural Resources Defense Council (NRDC) has concluded that American children are being harmed by the fruit and vegetable staples of their diets. These foods routinely and lawfully contain dangerous amounts of pesticides which pose an increased risk of cancer, neurobehavioural damage and other health problems. Little is being done by the US government to protect children from the intolerable risk to their health posed by pesticide residues in food, says the report.

Children are more at risk from pesticide residues in food than adults for several reasons. First, the typical child consumes fruits and vegetables at a significantly greater rate than adults, fruit comprising 20 per cent of the adult diet but 34 per cent of a pre-school child's diet. With this increased intake comes greater relative exposure to the pesticides present in food. Second, children may be more vulnerable to the effects of toxic chemicals, including pesticides. Experimental studies have shown that children are frequently more susceptible than adults to carcinogens and neurotoxins.

The NRDC study, the first detailed analysis of children's exposure to pesticides in food, found that between 5,500 and 6,200 of the current population of American pre-school infants may eventually develop cancer solely as a result of their exposure before six years of age to eight pesticides commonly found in fruits and vegetables. These estimates, based on scientifically conservative risk assessment procedures, indicate that more than 50 per cent of a person's lifetime cancer risk from exposure to carcinogenic pesticides used on fruit is typically incurred in the first six years of life.

The average child's exposure during the first six years of life to the potent carcinogen *unsymmetrical dimethylhydrazine* (UDMH), a breakdown product of the pesticide *daminozide*, is estimated to result in a cancer risk of approximately one case for every 4,200 children exposed. This is 240 times higher than the cancer risk considered acceptable by the US Environmental Protection Agency (EPA) during a full lifetime of exposure. Infants also receive unacceptable exposure to the carcinogenic fungicides *captan* (used on strawberries and other fruits), *chlorothalonil* (used on fruits, vegetables and peanuts), *folpet* (used on grapes, apples and melons), and *ethylene thiourea* (ETA), a constituent of the fungicide *mancozeb* (used primarily on tomatoes, potatoes, and apples).

The NRDC estimates that average exposure to these pesticides from consumption of fruits and vegetables in the first six years of a child's life may present a lifetime risk of one cancer case for every 33,000 to 160,000 children exposed. That means that out of the current pre-school population in the US, between 140 to 670 children may develop cancer some time during their lifetime as a result of exposure to these pesticides. These

risk estimates are approximately two to seven times what the EPA considers acceptable following a full lifetime of exposure. In addition, the NRDC charges that at least 17 per cent of the 3 million pre-school children in the US "may be exposed to neurotoxic pesticides at levels above what the government considers safe."

The NRDC warns that its study "may significantly underestimate" both the extent to which pre-school children are exposed to pesticides in food and the health risks of such exposure. The report points out that:

- 40 per cent of the pesticides classified by the government as posing "a moderate to high" health hazard cannot be detected by the residue monitoring techniques used by the Federal Drugs Administration;
- No account was taken of exposure to pesticides in products other than fruit and vegetables;
- The study only looked at the health risks incurred during the first five years of a child's life. The total lifetime cancer risk will be clearly be greater, since exposure to residues does not stop when one goes to school;
- The extent to which many of the pesticides are used has been grossly underestimated by the authorities, thus making a nonsense of many official carcinogenic risk assessments. According to the EPA, for example, only 5 per cent of apples are treated with daminozide; but the manager of one major company privately admitted that 10-11 per cent of the US apple crop is sprayed, whilst independent tests reveal that 30 per cent of the apples in one large supermarket chain had been treated;
- The study only reviewed 23 out of the 300 pesticides that can be used legally on food. Of the 66 pesticides deemed to be potentially carcinogenic by the US Environmental Protection Agency, only 8 were evaluated by the NRDC;
- The majority of the 600 active pesticide ingredients used in the US "have not been tested according to modern testing requirements, or the test data are unacceptable by today's standards." In 1984, the US National Academy of Sciences concluded that the safety data for 90 per cent of the pesticides available on the US market was insufficient to complete a full assessment of their health hazards.

The report concludes: "Our nation's children are being harmed by the very fruits and vegetables we tell them will make them grow up healthy and strong." It recommends that parents should wash produce carefully, peeling it when appropriate, and (where possible) switch to organically grown food.

Patrick McCully and Nicholas Hildyard

For further information, contact: The Natural Resources Defense Council, 40 West 20th Street, New York, New York 10011, USA.



*The great ziggurat of Ur, built approximately 2100B.C. The collapse of ancient civilisations is often attributed to political and economic rivalry but modern archaeological research indicates that degradation of the ecological resource base was usually the underlying cause.*

## **The Ecological Lessons of the Past: An Anthropology of Environmental Decline**

**By  
Timothy C. Weiskel**

*All civilisations depend ultimately on the ecological viability of their agricultural base, as the environmental archaeology of ancient civilisations makes clear. Expansionist Western industrial culture, dependent on resource-depleting petroleum-based agriculture, is only different in terms of its global scale. If the lessons of the past are not heeded its collapse will also be global.*

It is often stated that our present ecological crises are totally unprecedented. We are told that 1988 saw "the hottest summer on record" in North America, that Boston harbour has never in its history been so polluted, and that the European seal virus epidemic is on a scale never before witnessed by man. By stressing this 'never before' aspect of events, it is sometimes argued that the experience of the past is largely irrelevant for policy planners. Since circumstances are so new, so the argument goes, past experience leaves us with little or no instruction as to how to formulate a practical public policy for the environment.

This is not altogether true. While particular types of industrial pollution may be new and the scale of ecological devastation may be greater now than previously, the modern world is *not* confronting com-

pletely unprecedented circumstances — numerous civilizations before our own have confronted environmental degradation and have paid the price. If we continue to tie our society's infrastructure and agricultural production to a declining resource base — as ancient civilizations did with such depressing regularity — we too will suffer the fate of unavoidable collapse.

### **The Ecological Decline of Ancient Civilizations**

Many ecological catastrophes which have long been understood as 'acts of God' or 'natural disasters' were in fact largely generated or substantially aggravated by collective and cumulative human behaviour.<sup>1</sup> The repeated pattern of the rise and fall of ancient civilizations in the Mediterranean region is especially revealing in this respect. Recent archaeological research indicates that there was a substantial ecological component to the

emergence and collapse of agricultural complexes in ancient Mesopotamia, Phoenicia, Palestine, Egypt, Greece and Rome.<sup>2</sup>

These civilizations had to solve the basic problem of producing food surpluses and collecting raw materials from rural areas to sustain large urban populations engaged in commerce, ritual, government and the arts. Over time the strategies that each society pursued to produce food and procure resources left their characteristic mark on the environment. Some of these strategies proved not to be sustainable and overtaxed the regional natural resource base resulting in the depletion of water, soil, or forest reserves. The general pattern was one of gradual emergence, brief flowering, and rapid collapse of civilizations, often taking the form in the final stages of devastating military struggles for the control of arable land or essential resources.

Techniques of agricultural intensification, — terracing, crop selection, animal

**Dr. Timothy J. Weiskel** is an anthropologist and historian who works on problems of tropical deforestation in West Africa. He is currently a Henry Luce Fellow at Harvard University.



husbandry, irrigation, and the like — were devised to meet repeated crises of production. Despite short-term improvements in output, however, the long-term consequences of these technologies were not foreseeable by early agricultural innovators. In subsequent decades or centuries, problems of over-grazing, water-shed deforestation, soil erosion, siltation, water-logging, soil salinization and crop blight often left whole regions permanently destroyed for agricultural use.

Contemporary documents frequently explain these phenomena in terms of military, political or religious rivalry and conflict, perhaps most obviously because the élites that wrote such literature were part of military, political or religious institutions. These explanations inevitably oversimplify and distort a more fundamental understanding of the dynamic of agricultural civilizations.

Current archaeological research based upon scientific analysis of soil profiles, vegetation, and landscape evolution indicates that in the rise and fall of ancient civilizations there was at the base of nearly all sustained conflict a vital ecological component. Patterns of rivalry in the Mediterranean region could express either a momentary ecological crisis or a long-term depletion of some fundamental element of ecological capital. The ecological dislocations were frequently most visible in the 'peripheral' areas of the great Mediterranean empires, for it was here that the imperial powers established systems of commercial agriculture and proceeded to exact levels of agricultural production that exceeded the ecological capacity of the land.<sup>3</sup>

## The Ecology of European Expansion

The European expansionism of the last five hundred years has overshadowed — indeed, nearly totally eclipsed — the lessons that we should have learned from the repeated decline and collapse of ancient agricultural civilizations. This has led to a potentially fatal cultural blind-spot as to the vulnerability of our current industrial system of agriculture. Because of its experiences between roughly 1450 and 1950 — a period marked by seemingly unlimited expansion — the Western industrial world now finds itself conceptually ill-equipped to understand, and politically impotent to address, the problems of ecological adjustment that currently face all societies in our finite world.

---

*"The dynamic of industrial growth served to sustain the mythology of 'unlimited frontiers' and further transformed these formative frontier myths into a belief in perpetual economic growth. Having expanded upon the things of nature, the West came to believe that expansion was in the nature of things."*

---

Colonial discovery and settlement was to transform European agricultural techniques substantially in the New World. In the circumstances of comparative abundance, conservation of resources no longer seemed necessary. Whereas intensive techniques of resource husbandry had come to characterize the confined land-base of medieval European agriculture, the New World afforded rich new possibilities for agricultural expansion. In effect, since the discovery of the New World, predatory expansive agriculture and parasitic resource use has come to characterize European civilization, leading some emergent cultures to believe in a mythology of expanding 'frontiers'.

It is important to realize, however, that increases in agricultural output over most of this period were accounted for not so much by improvements in basic technology, as they were by the overall expansion of the land surface under cultivation. While total production rose dramatically, productivity per acre and productivity per unit of energy input often declined. Nevertheless, profits from total agricultural surpluses helped to finance the emergence of urban-based industrial systems. The dynamic of industrial growth served, in turn, to sustain the mythology of 'unlimited frontiers' and further transformed these formative frontier myths into a belief in perpetual economic growth. Having expanded upon the things of nature, the West came to believe that expansion was in the nature of things. Perpetual growth was considered both natural and good. The European experience of overseas expansion and the ensuing pattern of industrialization has engendered deep-seated habits of thought and images of cultural self-perception.<sup>4</sup> These images and mental metaphors leave the industrial world poorly equipped to construct a sustainable system

of production. In effect, we are trying to sustain a 'frontier culture' in a post-frontier world.

## Development and Ecological Degradation

In the present, just as in ancient times and in the age of colonial expansion, it is in the 'remote environments', distant from the centres of power, that the first indicators of environmental catastrophe become apparent. These regions are characterized by weak economies and highly vulnerable ecosystems, in our time just as they were in the past. The environmental condition of these regions constitutes an early warning mechanism for the ecological stability of the global ecosystem. If we begin to monitor this early warning system, we will recognize that the signs are not encouraging. Edward Goldsmith has summed up the overall situation:

"the last thirty years have been the most disastrous in the history of most, if not all, Third World countries. There has been massive deforestation, soil erosion and desertification. The incidence of floods and droughts has increased dramatically as has their destructiveness, population growth has surged, as has urbanisation, in particular the development of vast shanty-towns, in which human life has attained a degree of squalor probably unprecedented outside Hitler's concentration camps. With such developments, have come increased malnutrition and hunger; so much so, that today we are witnessing for the first time in human history, famine on a *continental scale*, with two-thirds of African countries to some degree affected."<sup>5</sup>

Several well-documented environmental and economic trends are of particular importance.<sup>6</sup> These include deforestation, the expansion of petro-chemical agriculture, the shift in weather patterns and perhaps climate in the semi-arid areas, continued population growth, and the penetration of local food markets with Western food surpluses through dumping or foreign aid. Deforestation is now becoming measurable from satellite in space. The scope of the transformation is massive (see *The Ecologist*, Vol. 17, No. 4/5). Yet despite the volumes of scientific studies that warn against the dangers, the pattern

of deforestation has not been noticeably reversed by acts of policy in recent years. Third World countries involved in the process of forest loss are by now genuinely concerned about its impact, but they are frequently impotent to do anything more than monitor what has occurred and is occurring.

## Is Development the Problem?

The issue of tropical deforestation may indicate whether institutions can adapt quickly enough to changing circumstance in the Third World. The World Bank intends to raise its funding for studies to preserve tropical forests from \$138 million to \$350 million by 1990. Moreover, it recognizes the need to fund projects that promote conservation, but it may well be that true conservation would require flat opposition to the 'development' programmes that have been launched and are likely to continue in the Third World. In any direct confrontation between the World Bank and the entrenched interests advocating conventional forms of trade, aid and development, it is not clear that the newly discovered environmental sensitivities of World Bank officials would prevail. Indeed, there are mounting signs that the policies of development that have caused the most rapid and irreversible forms of environmental degradation are

likely to endure. In fact, these policies are likely to be applied in an accelerated manner in the coming years, despite the best intentions of the World Bank's officials. For these reasons environmentalists are now beginning to ask: Is there not a fundamental contradiction between environmental conservation and 'development' as it has traditionally been conceived? Or, as Goldsmith has put it: "Is development the solution or is it the problem?"<sup>7</sup>

## The Underdevelopment Spiral

The destructive processes are so hard to stop because they are locked in what might be called: 'the underdevelopment spiral' (see Box). This is a syndrome of closely related social, economic and ecological phenomena which combine to cause a self-perpetuating cycle of environmental decline. As these phenomena interact they reinforce one another, accelerating a spiral of decline and making it increasingly difficult for any one party to intervene to arrest the process.

Additional elements may be present, and when they are, they tend to accelerate the pace of the spiralling interaction of the other elements. These added elements come into play when peasantries rightly seek to arrest the underdevelopment spiral, and take matters into their own hands. Typically this involves attempts to:

- 1) seek to resist direct government exactions;
- 2) seek better trade terms for items they produce;
- 3) seek control over arable land in order to pursue autonomous farming.

## Post-War Africa: A Case-Study in Ecological Devastation

Throughout Africa and much of the rest of the Third World during the colonial period, rural regions became accustomed to imported manufactured goods that had become essential for their households or their agricultural pursuits.<sup>8</sup> Axes, machetes, hoes, pots, cotton cloth, and a whole range of petty manufactured goods, from matches to kerosene lanterns, penetrated into rural regions during the early years of colonial rule. At the same time, these regions had become accustomed to producing agricultural commodities like peanuts, coffee, cocoa and cotton to earn the money to purchase these products.

During the Second World War, however, the supply of European manufactured imports was cut off by scarce or non-existent shipping. This raised the price of imports considerably, and for some time many goods simply were not available at all. At the same time agricultural commodities produced for sale exceeded shipping capacity, and thus their price dropped in local markets. These combined phenomena created considerable pressure for economic and political change in the immediate post-war period. With the post-war increase in shipping capacity, there ensued a boom period of economic expansion. The colonial administrations could content themselves with building roads and public works while maintaining public order, and needed to do little positive planning to encourage economic growth. The cash-crop boom, although sustained for several years, remained nevertheless an inherently unsustainable phenomena, ironically because of its very success. So many peasants in the Ivory Coast, Ghana, Nigeria and the Cameroons turned to cocoa and coffee production that the mounting supply exceeded world demand, and the prices for these commodities began to fall in real terms during the 1950s. As Brazil and East African countries like Kenya entered the ranks of coffee and cocoa producers the purchase prices of these commodities declined even further.

## Elements of the 'Underdevelopment Spiral'

- the expansion of cash-crop agriculture in the Third World
- the secular decline of real prices of Third World commodities in world trade
- the growth of cash exchange, collapse of local artisans and expanded merchandising of European manufactured goods.
- displacement of indigenous food crops by exogenous, hybrid, or petro-intensive cultivars
- the decline of small-holding agriculture and increase of 'landless peasants'
- the movement of Third World populations from rural to urban areas
- demographic expansion in Third World populations
- the industrialization of agriculture and overproduction in industrialized nations
- changes in local weather and micro-climate patterns
- local and regional food shortages and the growth of international food trade and aid
- destruction of agricultural or pastoral lands through overgrazing, loss of topsoil, salinization, and flooding, and waterlogging
- the fitful but secular increase in the price of petroleum and petroleum products
- the long-term increase in relative prices of manufactured goods
- the growth of Third World indebtedness
- the expansion of bureaucracies, the collapse of public services and the growth of corruption

## Added Elements in Exceptional Cases

- the escalation of conflict in rural areas, diverting efforts from agricultural production
- the growth of an international arms trade, costing further drains on foreign exchange
- the outright destruction of crops, villages, and ground cover through ground combat, bombing, chemical defoliation or purposeful torching of biota to destroy an opponent's means of securing shelter, food or a livelihood.



# Development, War and Ecology

In taking into account the environmental costs of various development strategies, scholars have tended to neglect the ecological impact of open conflict. Not all concerns are similarly myopic. Businesses involved in Third World agriculture projects regularly include considerations of 'security' as part of the operating costs they need to incur to protect their investments. If peasant resistance or sabotage to these projects becomes too expensive, the enterprise nearly always calls upon the state military apparatus to undertake the effort and expense of suppressing peasant opposition. The costs of repressing peasant revolts are readily calculable in terms of munitions and manpower, but the

costs to the peasants' environment or to the world's ecosystem are usually overlooked. If we are to develop a reasonable means of assessing the environmental costs of development strategies, we should try to include this 'externality' in our calculations. The policy implications of undertaking these economic calculations would be significant, for whatever the economic virtues of pursuing conventional development strategies in regions like Central America, the ecological destruction involved in crushing peasant rebellions or launching counter insurgencies is massive and needs to be counted as a real cost in any cost-benefit analysis of proposed development strategies.

## Urban Drift

Oversupply was at the root of the declining purchase price for these commodities and although the 'rational' economic response would have been for peasants to refrain from producing further cocoa or coffee or the like until the supply declined and the prices came up to a reasonable level, this was never really an option for most peasants as they had already made the infrastructural investment in the cocoa and coffee plantations. In the face of a depressed price, a peasant with fixed or escalating costs or other demands upon his income had basically two options open to him. Either to expand the scope and scale of his production to maintain or enlarge his income to meet his growing needs, or to leave cash-crop farming and go to the city in a hopeful search for non-agricultural work.

The option of engaging once again in food-stuff agriculture was largely precluded by the impact of the agricultural overproduction in the Western countries, particularly the United States. Through both aid and trade channels, the United States sought actively to export its agricultural surpluses.<sup>9</sup> Since most capital cities of Third World countries were constructed as ports or trans-shipment centres during the colonial period, it became very easy — and even appeared wise — to purchase American grain surpluses to feed growing urban populations in the Third World. When disasters like floods, earthquakes or typhoons damaged the remaining local agricultural systems, U.S. aid agencies provided relief supplies of food at cost.<sup>9</sup>

The self-perpetuating nature of the problem started to become apparent by the early 1960s. Peasants, trying to stay afloat economically, began to devote more and more of their arable land to cash-cropping which, in turn, provided less and less, in relative terms, the more they produced. From the 1960s onward, with relatively

less land and labour devoted to foodstuff agriculture in Africa, not only its urban areas, but also major rural regions became dependent on substantial imports of foreign surpluses. According to Jennifer Whitaker, "food imports rose from 4 million to 24 million tons during the 1970s. By 1985, the continent was importing two-fifths of its food supply and about a third of its people depended wholly or partly on imported food."<sup>10</sup> Meanwhile, those peasants or their children who had left the village began to swell the ranks of the urban unemployed or underemployed.<sup>11</sup>

## The Debt Burden

Hungry urban populations prove to be politically volatile, and so urban-based political élites tended to continue to buy political tranquillity in the short-term by purchasing food from the cheapest source — the surpluses of Western industrial countries. In order to gain the foreign exchange to purchase this foreign food, the state exhorted its cash-cropping peasants to produce ever greater quantities of export commodities. While exports expanded, commodity prices slumped with oversupply, and foreign exchange became scarce, despite expanded output, the states concerned therefore either had to seek food aid or incur foreign debt to purchase the food upon which they had come to depend. Indebtedness proved to be only a short-term solution, and many African countries soon found themselves devoting much of their foreign exchange earnings to servicing these debts. The overall debt burden for the continent rose from \$14 billion in 1973 to an estimated \$125 billion in 1987.<sup>12</sup>

Faced with the departure of the young, able-bodied members of their households to the rapidly growing cities, families often resorted to having several children in the hope that some would remain to under-

take the ever more demanding cash-crop work. Collectively this translated itself into a rapid spurt in population growth, particularly as this period also witnessed the arrival of rudimentary medical facilities and the equipment for clean water supplies in rural areas which contributed to the decline in infant mortality.

During the 1950s and 1960s, the area devoted to agricultural activity greatly expanded while the technologies applied to production changed little. In bush-fallow systems, fallow periods were shortened or eliminated altogether, and on the thin and nutrient poor soils this new pattern of usage rapidly exhausted arable lands. In addition, previously undisturbed forests began to be cleared as governments short of foreign exchange, extended rights to timber concessions for cutting and exporting tropical hardwoods and as peasants, often displaced from their own lands began to encroach upon the remaining areas of uncut forest.

## Changing Weather Patterns

The removal of large portions of tropical forest cover and conversion of whole regions to cropland and grassland had the effect of changing the nature of the local hydrological regime. Water which previously was held in the canopy or locked in the root systems of vegetation in the forest, ran off at accelerated rates with little or no ground cover left to hold it. Dramatic flooding became a feature of the rainy season in many parts of Africa, and considerable topsoil was lost to sheet and rill erosion. Some regions of African rural areas have been so overgrazed, over-cropped and eroded that it is doubtful that agriculture can continue on these soils for much longer without considerable imported subsidies to rebuild soil structure and fertility. In areas where soil depletion and the change of ground cover has been

in long-term decline, local weather patterns may be disrupted.<sup>13</sup>

Populations that have become dependent upon purchasing food in exchange for cash can find themselves short of food for reasons well beyond their control. Fluctuations in the price of oil affect both international shipping and internal transport costs of food as well as the total foreign exchange profile of individual countries. Thus, the fitful increases in oil prices have been translated in local terms in Africa into an increase in the price of imported food and occasionally a pattern of seasonal or chronic shortage. This is compounded as the world market in grains fluctuates with the purchasing habits of major industrial countries. When Soviet, Chinese or Indian harvests are poor and Western grain surpluses are bought up on the international market, prices rise beyond African countries' purchasing power. As we have seen in recent years, food shortages can become acute and famine widespread in these circumstances.

## Green Revolution

'Modernized' agriculture based on 'green revolution' technology is offered by Western agricultural experts in the wake of these famines to meet the urgent and evident need for expanded food production. Generally these technological packages are based upon 'high-yield-varieties' (HYVs) of crops that have been selected to respond well to a combination of fertilizers and pesticides designed for their needs. In this regard, the HYVs are more appropriately labelled 'high response varieties' (HRVs). They respond well to the petro-chemical subsidies which they were engineered to use, but on their own their performance is often not even equal that of traditional varieties.<sup>14</sup> When one considers the probable rise in cost of the petro-chemical additives needed to produce a reasonable crop, along with the infrastructural investments required for irrigation systems, storage systems and mechanized equipment associated with the 'modernized' agriculture, it is clear that the choice of these technologies is not a wise one. Similar investments in roads, marketing facilities, or land directed towards traditional crops may well prove over the long run to be better spent than the money devoted to the alluring promise of 'miracle' crops. In the face of declining petroleum supplies, it is questionable whether development schemes based upon increas-

ingly energy-intensive technologies can be sustained much longer.<sup>15</sup>

## Problems of Perception

The problem of perception complicates the issue of achieving an adjustment between expanding demand and declining resources. In general, it is recognized that there are upper limits involved in the amount of information that an individual or a society can successfully absorb and act upon. After a certain threshold, as the environment becomes more complex, a society's ability to recognize or use information about its circumstance effectively declines. It is as though things become too complicated to know what is happening. This may well reflect our current position as regards the Third World. Ecological problems are global in scope, and we will need to develop a matching degree of perception. Tropical deforestation affects both local weather and world-wide climate patterns. Food from Iowa feeds both Boston and Burundi. Currently, it is in the Third World that global ecological crises become most pronounced, but it would be a major mistake of perception for Western

leaders to assume that the problems in the Third World are merely the Third World's problem.

## Cooperation For Stabilization

Broadly speaking, there seem to be two possible patterns that emerge. First, it is possible that a stable adjustment can be achieved. This would be possible if the entire population concerned perceives the problem of adjustment as a real one, and simultaneously cooperates to achieve stabilization. Such a resolution implies that the society can exercise a remarkable degree of self-imposed restraint.

## Ecological Overshoot

An alternative resolution of current and future trends involves the phenomena of ecological 'overshoot' and subsequent collapse. This would most likely occur either if the society did not perceive the problem at hand or if it did not succeed in achieving cooperation in a transition to a stable adjustment. The time lag involved between the overshoot and subsequent

# HMSO publishes for the Institute of Terrestrial Ecology

JUST PUBLISHED

## A Field Key for Classifying British Woodland Vegetation Part II

R BUNCE

Each of 103 British woodlands was sampled by random plots, and Part I of the key provided the classification of vegetation within them. This booklet integrates the plot data into woodland types based on the canopy and ground vegetation. As well as providing the first formal system to enable whole woodland sites to be classified, it will provide useful background information for those interested in the wider ecology of British woodlands.

Maps and colour photographs ISBN 0 11 701417 6 Paperback £7.95 net

Forthcoming: **Climatic Change, Rising Sea Level and the British Coast**  
**The Distribution and Status of Heather in England and Wales**

If you would like a leaflet and ordering details for all ITE titles now being sold by HMSO, write to: HMSO Books P9(D), FREEPOST, Norwich NR3 1BR (no stamp needed.)





collapse is not at all clear. Nor is it clear just where we are located at the current moment in either of these two possible scenarios. Some scientists feel that we may already have exceeded the earth's capacity to sustain present populations on a permanent basis.<sup>16</sup> We are perhaps beginning to witness the phenomena of collapse in indicative catastrophes ranging from repeated Bangladesh floods to recurrent African famine.

Whatever the time-scale, there are very definite signs of difficulty emerging. Briefly put, Western agriculture, and American agriculture in particular, has achieved enormous levels of output through a pattern of substituting human agricultural labour with fossil fuel-driven machines. The result is that while there has been a substantial decrease in the human labour used on American farms during this century, there has been an overall increase in the energy subsidy required to obtain one calorie of consumable food in the American food system.<sup>17</sup>

Moreover, the vast majority of the energy subsidy provided to the food system in the United States is not reflected in the amount of food energy consumed. The long range trend from the 1920s until the present suggests that increases in energy inputs into the system have been approaching a point of diminishing returns in terms of overall food production. If this trend persists, future increases in food output will require even higher rates of energy inputs. This is a disturbing circumstance, particularly in view of the decline in food self-sufficiency of large numbers of Third World countries.

## Dead End

We cannot base our agriculture on fossil fuels and expect that agriculture to outlast the supply of this resource. Unless steps are taken in the near future to change to bio-sustainable forms of agricultural technology we can expect wide-scale dislocations including famine, disease and open-armed conflict on an ever-larger scale, as oil supplies decline and competition to control its use intensifies. We live in a highly industrialized, urban culture, but it is important to remember that there is no such thing as a 'post-agricultural' society. Policy decisions concerning agriculture, our environment and the future provision of public works (water projects, transport systems, land-use patterns, etc.) need to reflect this fundamental truth. Cultures that failed to understand this in the

past have proved to be short-lived. We will be no exception to this pattern.

With our current patterns of resource-depleting, petroleum-based agriculture, it is as if we are travelling down a dimly lit, one-way street at 90 miles per hour, and we are just beginning to realize that the sign post we passed a while back said "Dead End". Action to avert future catastrophe in this circumstance must begin now on the part of all responsible political leadership. The remaining transition period cannot be very long. This is not a party-political issue. Nor is it simply a problem for the welfare of particular nation-states. It concerns our survival as a species.

This article is an edited version of testimony submitted to a hearing on the Environmental Protection Act of 1988 held by the United States Senate committee on Environment and Public Works.

## References

1. A useful summary of ancient ecological problems can be found in J. Donald Hughes, *Ecology in Ancient Civilizations*, U. of New Mexico Press, Albuquerque, 1975. There has been some debate among archaeologists as to the relative importance of human agency or environmental change in explaining accelerated soil erosion in the circum-Mediterranean over historic time. While climate theories were previously favoured, theories stressing anthropogenic activity are gaining ascendancy, for example, Kevin Greene, *The Archaeology of the Roman Economy*, U. of California Press, Berkeley, 1986, p. 85; S. Judson, 'Alluviation and Erosion', in E. Fentess et al., *Excavations at Fosso della Crescenza 1962*, Rome, 1982, (Papers of the British School of Rome, No. 51), pp. 58-101; Claudio Vita-Finzi, *Archaeological Sites in Their Setting*, London, 1978, especially, pp. 8 and 11-13.
2. H. W. Lawton, and P. J. Wilke, 'Ancient Agricultural Systems in Dry Regions', in A. E. Hall, G. H. Cannell, and H. W. Lawton, (eds.), *Agriculture in Semi-Arid Environments*, Springer-Verlag, New York, 1979, pp. 1-44. Popular, if somewhat dated accounts include: Edward Hyams, *Soil and Civilization*, Harper and Row, New York, [1952] 1976; Vernon Gill Carter and Tom Dale, *Topsoil and Civilization*, University of Oklahoma Press, Norman, 1976.
3. See for example, W. Groenman van Waateringe, 'The Disastrous Effect of the Roman Occupation', in R. Brandt and J. Slofstra (eds.), *Roman and Native in the Low Countries: Spheres of Interaction*, British Archaeological Reports 184, Oxford, 1983, pp. 147-157; Claudio Vita-Finzi, 'Roman Dams in Tripolitania', *Antiquity* 35, 1961, pp. 14-20; Z. Naveh and J. Dan, 'The Human Degradation of Mediterranean Landscapes', in F. Di Castri and H. A. Mooney (eds.), *Mediterranean Type Ecosystems*, Springer-Verlag, New York, 1973, pp. 373-390.
4. For a discussion of the impact of the frontier experience upon ecological consciousness in America see, Timothy C. Weiskel, 'Rubbish and Racism: Problems of Boundary in an Ecosystem', *The Yale Review*, Winter, 1983, pp. 225-244.
5. Edward Goldsmith, 'Is Development the Solution or the Problem?', *The Ecologist*, Vol. 15, Nos. 5/6, 1985, p. 210.
6. A number of global 'commissions' have been constituted to investigate the widening gap between the 'developed' and the 'underdeveloped' world, most notably the two chaired by Willie Brandt: Brandt Commission — Independent Commission on International Development Issues, *North-South: A Program for Survival*, M.I.T. Press, Cambridge, 1980; Brandt Commission, *Common Crisis: North-South: Cooperation for World Recovery*, M.I.T. Press, Cambridge, 1983. For a critique of the Brandt Commission approach see, Teresa Hayter, *The Creation of World Poverty: An Alternative View to the Brandt Report*, Pluto, London, 1981. See also, United States Department of State and the Council on Environmental Quality, *Global 2000: A Report to the President*, Washington, 1980; World Commission on Environment and Development (Brundtland Commission), *Our Common Future*, Oxford University Press, 1987.
7. op. cit., supra 5.
8. For a more extended discussion of a case-study see, Timothy C. Weiskel, 'Toward an Archaeology of Colonialism: Elements in the Ecological Transformation of the Ivory Coast', in D. Worster (ed.), *The Ends of the Earth*, Cambridge, 1988, pp. 141-171.
9. For a summary of U.S. export food policy see, Alain Revel and Christophe Riboud, *American Green Power*, Johns Hopkins U. Press, Baltimore, 1986. For a critique of the impact of U.S. surplus exports see, Frances Moore Lappé, Rachel Schurman and Kevin Danaher, *Betraying the National Interest*, Institute for Food and Development Policy, San Francisco, 1987. For a discussion of the various impacts of foreign food dependence see, Timothy C. Weiskel, 'A Public Policy for Plant Genetic Resources', *Worldview* 23, 10, October, 1980; 'Food, Famine and the Frontier Mentality', *Worldview*, 12, 12, December, 1981.
10. Jennifer Seymour Whitaker, *How Can Africa Survive?*, Harper & Row, New York, 1988, p. 18.
11. Urbanization rates are exceeding population growth in most of Africa. Mexico City is already the largest city in the world and growing at a rate of 1 million per year. Asia will have 23 cities with populations of 5 million or more by the year 2000. See, "Population Boom for Asian Pacific", *UPI News*, 7 June 1988, 17:47 pm.
12. op. cit., supra 11, p. 19.
13. Richard W. Franke, and Barbara H. Chasin, *Seeds of Famine: Ecological Destruction and the Development Dilemma in the West African Sahel*, Allanheld, Osmun, Montclair, 1980; Alan Grainger, *Desertification: How People Make Deserts, How People Can Stop and Why they Don't*, International Institute for Environment and Development, Washington, 1985; Independent Commission on International Humanitarian Issues, *Famine: A Man-Made Disaster?*, Pan Books, London, 1985.
14. Kenneth A. Dahlberg, *Beyond the Green Revolution: The Ecology & Politics of Global Agricultural Development*, Plenum Publishing Corporation, New York, 1979; Tim Bayliss-Smith, and Sudhir Wanmali (eds.), *Understanding Green Revolutions: Agrarian Change & Development Planning in South Asia*, Cambridge University Press, 1984; Edward C. Wolf, 'Beyond the Green Revolution: New Approaches for Third World Agriculture', *Worldwatch Paper No. 73*, Worldwatch Institute, Washington, D.C., 1986.; Bernhard Glaeser, *The Green Revolution Revisited*, Allen & Unwin Incorporated, Winchester, MA, 1987.
15. Maurice B. Green, *Eating Oil: Energy Use in Food Production*, Westview Press, Boulder, CO., 1978; John Gever, et al., *Beyond Oil: The Threat to Food and Fuel in the Coming Decades*, Ballinger, Cambridge, 1986; David Weir and Mark Schapiro, *Circle of Poison: Pesticides & People in a Hungry World*, Institute for Food & Development Policy, San Francisco, 1981; David Bull, *A Growing Problem: Pesticides and the Third World Poor*, OXFAM, Oxford, 1982; David Weir, *The Bhopal Syndrome: Pesticide Manufacturing and the Third World*, International Organization of Consumers Unions, Penang, Malaysia, 1986.
16. "Population bomb" still ticking, *UPI News*, 3 Sept. 1988, 11:57 am.
17. John S. Steinhart and Carol E. Steinhart, 'Energy Use in the U.S. Food System', *Science*, 184, 19 April 1974, pp. 307-316.

# Mumford on the City

by

Grover Foley

*Throughout history, cities have flourished and collapsed. For Lewis Mumford, the final stage in the cycle invariably comes with the emergence of the overblown urban jungles of 'megapolis' — be it Ancient Rome or modern-day New York. Mumford sees the solution in halting the growth of cities and restoring the local community. For a city that forgets its limits is a city that has lost its reason.*

On a spring evening in 1917, the 22-year-old Lewis Mumford walked across New York's Brooklyn Bridge. Against the setting sun, the city's skyline seemed ringed by a halo; as the sky darkened, the lights began to go on throughout the city. "Here was my city," said the rapt youth, "immense, overpowering, flooded with energy and light." He drank in the city and sky, both vast, yet both a part of him. "In that sudden revelation of power and beauty," he later wrote, "I trod the narrow, resilient boards of the footway with a new confidence." He felt the very cosmos calling him to explore the swirling, dizzying romance of city life.<sup>1</sup>

During the next decades, Mumford became a master interpreter of the city. In 1938, his book *The Culture of Cities*, put him on the cover of *Time* magazine. In 1961, he brought out a still more acclaimed sequel, *The City in History*.<sup>2</sup> Yet the city had changed. No longer, as in 1917, did he eulogize its overpowering energy. *The New York Times* review called his 1961 book more than urban history: "It is moral philosophy of a high order and tragic poetry."

Tragic, because Mumford saw the city losing control of itself. Leading voices called for growth without limits. Herman Kahn hailed the seaboard cities of the future, Bos-Wash and San-San; Buckminster Fuller extolled giant new pyramid cities; Konstantin Doxiadis, the coming world city, Ecumenopolis. Leading urban

theorists forecast high-tech habitats — Le Corbusier's "City in a Park", for instance, with its high-rise buildings intersected by parks and parking lots. Even Mumford's ally Frank Lloyd Wright, who once planned a rural "Broadacre City," later proposed its antithesis: the Skyscraper-a-Mile-High. Some of those opposed to high-rise housing, like Mumford's critic Jane Jacobs, still denied any limits to growth. Our cities, said Jacobs, can give us "unlimited resources". The more cities and people, the more resources. "The idea that, under sensible economic planning, population growth must be limited because natural resources are limited is profoundly reactionary."<sup>3</sup>

## The Throwaway Fun City

But the gospel of growth found perhaps its most successful promoter in the world's most widely read futurologist, Alvin Toffler. All we have to do, said Toffler, is adjust to speed, avoid "future shock," and learn to "surf on change" like the jetsetters. No need to worry about war, scarcity, or joblessness — the high-tech future bans them, if we only embrace it fully. In the coming "throw-away culture", the city will become a Fun Palace.<sup>4</sup> Since the whole world will enjoy a standard of living higher than that of current day Americans, we can look forward to ever-changing, even moveable cities. The modular Fun City of the future will be moved by hovercraft or giant "ground effect" machines. "The ultimate," said Toffler, "is an entire urban agglomeration freed of fixed position, floating on a cushion of air, powered by nuclear energy, and changing its inner shape even more rapidly than New York does today."

A strange dream. Long before the Mad Paver turns the planet into wall-to-wall concrete, our overgrown cities will have choked in their own waste or incinerated one another in nuclear flames. Such experts, says Mumford, ignore the lessons of history: time and again, cities have grown largest just before their collapse. How close are our own cities to collapse? Physical and social breakdown threaten. But war also. Within forty years, two world wars killed over sixty million people. The final world war, for which we frenziedly prepare, will kill a hundred times more. The mega-city has become the ideal target for the mega-weapon. How can we discuss the city's future while ignoring its non-future?<sup>5</sup>

Of course some would say that even looking at Mumford's alternative to Fun City is wasted effort. Mumford, says Jane Jacobs, simply loathed the city. "How could anything so bad be worth the attempt to understand it?"<sup>6</sup> A more recent urban theorist agrees. Writers like Mumford, says Alison Ravetz, rejected the city out of hand: "It could be discarded without a second thought."<sup>7</sup>

A bit curious, since Mumford has plainly tried to understand the city more than most of his critics. Not only did he begin studying it in the twenties, later contributing one hundred and forty-eight "Sky Line" articles to *The New Yorker*, but in his two major works he took the reader from the stone age village to the modern megalopolis. Such breadth forestalled wide-eyed hopes or simplistic reforms. Despite media eulogies to vibrant New York, swinging London, or go-getting Tokyo, Mumford's view of the large city grew ever more sombre. In 1938, almost half his book discussed ways of renewing the city (though Jacobs claims it "was

**Dr. Grover Foley**, writer on technology, has taught social responsibility of science and technology at the Royal Melbourne Institute of Technology; medical ethics and the ethics of technology at the Auckland Technical Institute; and philosophy, religion and ethics at various universities in the United States. He can be contacted at: 416 Cahora Avenue, Remuera, Auckland, New Zealand.





"Here was my city," wrote the young Mumford, "immense, overpowering, flooded with energy and light." But as New York grew and spiralled into social decline, Mumford changed from eulogising the energy of city-living to warning of the need to restrain urban growth.

largely a morbid and biased catalogue of ills").<sup>8</sup> In 1961, though Mumford hoped to update those pages, he left out rosy promises.

## The Rise and Fall of Megalopolis

In 1938, his section on the city's fall, "A Brief Outline of Hell",<sup>9</sup> met with the least understanding. Yet the destruction of many cities, from Warsaw to Hiroshima, was only a few years away. Though now restored, their splendours may mask another, greater round of decay. Cities meet physical and social limits, either drowning in their own refuse, succumbing to crime, or becoming targets in a giant self-destructing system. To see where the city is heading, we must rethink the Renaissance itself, the despised 'Dark Ages', and our fabled scientific civilization.

Cities rise and fall like civilizations. They are, after all, its core, and they cannot escape its own trajectory. Its illnesses are theirs. A given city may deny or reverse the trend. But the overall pattern, says Mumford, is clear. He sees, broadly speaking, six stages:<sup>10</sup>

### 1. Eopolis.

The city begins as a village, its earliest, most enduring form. Thanks to the agricultural revolution, the village achieved a food surplus with storage

utilities and permanent dwellings. When large cities collapse, villages survive at their margins or rise again from the debris. As a small village near Edinburgh boasts:

'Musselburgh was a borough when Edinburgh was none,

And Musselburgh will be a borough when Edinburgh is gone.'

### 2. Polis.

At a common site, shrine, or fortress, villages join forces to form a city. The city brings more tools, division of labour and time for science and contemplation. It has larger buildings, such as schools and stadiums, and broader groups, such as an army and a bureaucracy. But it retains older values too: rural work and customs, reverence for family and ancestors, and a pervasive moral and aesthetic culture.

### 3. Metropolis.

Now one 'mother-city' rises above the others. Thanks to long distance trade, it develops writing, record keeping, and more specialized work. Manufacturing begins to dominate agriculture. Its citizens enjoy more art, culture, and freedom from taboos. But problems come too: private greed weakens social ties; money becomes a status symbol; class struggles begin between the rich and the landless workers. As examples Mumford cites; Plato's Athens, Dante's Florence, Shakespeare's London and

Emerson's Boston.<sup>11</sup>

### 4. Megalopolis.

The city grows more powerful, yet more threatened. It rules by war and trade, by enterprising aggression and aggressive enterprise. Rural landlords, trained for war, join with urban financiers, trained for profit. Athens' will-to-culture yields to Rome's will-to-power. Culture becomes standardized, art mechanical, form monumentalized: fame goes to the largest statue, the tallest building, the biggest population. Examples include: ancient Alexandria and Rome; Byzantium in the tenth century; Paris in the eighteenth century; New York in the twentieth century.

### 5. Tyrannopolis.

Now the state replaces local and communal groups. Order is imposed from above by new Caesars or gangster-dictators (Hitler or Mussolini, for example). Spending and display replace civic virtue. Wars of empire lead to civic debt and bankruptcy. Parasites and criminals flourish: the respectable become criminals, criminals become respectable. Cycles of speculation, over-expansion, and depression lower production. Farmland erodes. The masses become a *Lumpenproletariat*, calling for bread and shows, sinecures and mass-sports. Some citizens begin to flee the city's chaos and its police.

### 6. Necropolis.

War, famine, and disease spread. Monuments lose their meaning, social life decays, even trade breaks down. Viaducts collapse, shops are looted, grass grows through the pavement. Culture survives, at most, in the provinces. Vandalism becomes the rule; the city is plundered. "Sand sweeps over the ruins: so Babylon, Nineveh, Rome." The once living city becomes a tomb for the dying.<sup>12</sup>

Not that this trajectory is inevitable. Against Spengler and Sorokin, Mumford says the living reality of the city may defy its logical stages. Regional centres may survive and bring in new energies. New growth may begin toward the end of the cycle. Or accident and injury may cause decay at an earlier point. Though the tree's crown may die, its trunk can put forth new shoots. Social life is too complex for rigid laws. But one thing is clear: with the arrival of megalopolis, the city is on a downward course.

Mumford sets this sketch of the city against the background of civilization's

# WADEBRIDGE ECOLOGICAL CENTRE

## A Major Study of THE SOCIAL AND ENVIRONMENTAL EFFECTS OF LARGE DAMS

by Edward Goldsmith and  
Nicholas Hildyard

### Volume 1: Overview

The Report considers such issues as the politics of damming, the problems of resettlement, the spread of waterborne diseases, flood control, water-logging and salinisation, management and maintenance and the effects of hydropower and irrigation projects on land and water use. It also considers the vernacular irrigation methods of five traditional societies.

### Volume II: Case Studies

This volume includes thirty-one case studies, describing or assessing the social and environmental effects of large dams and other water development schemes that have either already been built or that are on the drawing board. The case studies selected are in:— the USA, Canada, Australia, Hungary, Norway, Tunisia, the Sudan, Egypt, Senegal, The Gambia, Ghana, Mozambique, Nigeria, Brazil, India, Sri Lanka, Bangladesh, Thailand, the Philippines, China and the USSR.

### Volume III: Bibliography

This volume is in preparation and will be available in Summer 1989. It is a review of the useful literature (over 400 books and articles) on the different social and environmental effects of large dams and other water development schemes.

**Price:** £30 per volume (Individuals, Environmental Groups and Third World Institutions); £45 per volume (Institutions); (airmail postage £10 per volume extra).

**Complete Set:** £80 (Individuals, Environmental Groups and Third World Institutions); £120 (Institutions); (airmail postage £30 per complete set extra).

Please send your cheque/postal order to **Ecosystems Ltd., Worthyvale Manor Farm, Camelford, Cornwall, PL32 9TT, U.K.**

stages. He does not, like Jane Jacobs, celebrate the giant city while assailing the nation-state. For him, city and civilization share a common pathology: power beyond reason. Both begin as heaven and may end as hell. The Pharaohs of Egypt left behind temples and tombs. Will we leave behind more than missile silos and fallout shelters?

### The Emergence of 'Axial' Man

Ancient civilization, Mumford believes, had its own cycle. Tribal man gave way to urban, 'civilized' man. But the splendid empires fell victim to their pillaging armies. As their very goods became evils, 'axial' man arose (after the Greek *axios* or 'value'). From Amos to Lao-Tze, prophets and philosophers called for humility, not pride; love, not force; peace, not conquest. Out of the rubble of empire arose at length 'Old World Man'. Throughout the Middle Ages he sought both stability and transcendence, merging the values of archaic, civilized, and axial man.

But now came a new world, of science and discovery, of Galileo's telescope and Columbus's sextant. "New World Man" comes to believe in endless progress. He sees no limits to power, growth, and knowledge. But this new civilization faces its own crisis. Can its wisdom and ethics keep pace with its power? Consider the final stages of the Roman Empire. With the rise of empire, the gulf between rich and poor widened. The Greeks' lean diet gave way to the Romans' colossal daily feasts. "The little people," said Petronius Arbiter, "came off badly: for the jaws of the upper classes are always keeping carnival."<sup>13</sup> Though Rome boasted of peace and justice, it ruled by exploitation. Forum, bath, vomitorium: these were its central features. Like a mighty oak, its broad branches hid the rottenness at the core. Its diseased roots might nourish truffles, but not more wholesome food.<sup>14</sup> Throughout the crumbling empire, vicarious thrills blinded men to the real threat. As the Vandals besieged Augustine's city of Hippo, says a contemporary account, "the groans of the dying defenders on the wall mingled with the roar of the spectators in the circus."<sup>15</sup>

### Medieval Balance

After Rome came the "Dark Ages". But not as dark as we often think. Victorian critics thought them filled with squalor and

injustice. Yet the people, living close to nature, with open windows and market places, had better health than in more refined ages. The barnyard smells were no worse than the open sewers that, only a century ago, flowed through cities like Berlin. Dogs and chickens helped clean the streets; the ever-present pig likewise "was an active member of the Board of Health".<sup>16</sup> The cities also kept a sense of community: housewife and husbandman were less lonely than today, while children enjoyed more contact with life in the marketplace than in today's sterile supermarkets. People made their own amusements. Song flourished, in workmen's shanties, monks' plainsong, and troubadour's ballads. Despite its many dangers and discomforts, this life knew beauty. "The town itself was an ever-present work of art: and the very clothes of its citizens on festival days were like a flower garden in bloom."<sup>17</sup> Citizens needed no courses in art appreciation. Craftsmen rejoiced in their work, finishing even the hidden parts of a cathedral with care—for, as Ruskin noted, "God at least would bear witness to the craftsman's faith and joy."<sup>18</sup>

Their vigorous outer life, Mumford felt, drew strength from the inner. To gain time for study and prayer, the monks invented labour-saving machines. Often they harnessed the river's power. At Clairvaux Abbey they led the flow first to the corn-mill to grind the grain and shake the sieve, then to the boiler for beer, then to the fulling-mill for washing clothes, then to the tannery, then to assist in such chores as cooking, crushing and grinding, until at last it carried the refuse away.<sup>19</sup> The cloister in turn brought a feeling for the inner life, preserved much later by Protestants in the private 'closet' for prayer and meditation. The spirit of the cloister entered the city's heart, as the monks laboured to convert the sinner and succour the needy. The new friaries with their walled gardens brought country spaciousness into even the most crowded towns.

### Baroque Grandeur

Mumford calls the next major phase of urban evolution the "baroque". Its splendors concealed the seeds of decay. The new cities focussed on king and counting-house, on pride and wealth. Baroque style showed the two faces of New World Man: the mathematical-methodical and the sensuous-extravagant. On the one hand, rigorous street plans, formal city layouts, and orderly gardens; on the other, open sexual-



ity, power-obsessed statecraft, and religious fanaticism.<sup>20</sup> Mars and Venus were the chief deities — until, in the age of mass production, “Vulcan finally cast his cunning iron net of utilitarianism over their concupiscent forms.”<sup>21</sup> Constant war led to large standing armies. In 1740, almost a quarter of Berlin’s 90,000 people belonged to the army. The state, under new absolute rulers, replaced the corporations and city-states. People lost their old ties to guild, neighborhood, or city. While science reduced life to atoms, the state reduced men to particles of power. The Prince and the capitalist saw no limits. No merchant was too rich; no state too expansive; no city too big. The very layout of the streets served power. On the wide straight avenues the rich could daily parade their wealth, or the monarch his troops.<sup>22</sup> The ‘asterisk plan’ came into favour: avenues that focussed on a single point let troops move in unbroken ranks to control the people, while artillery could command every approach. But such plans made little provision for neighbourhood life: there were no playgrounds for children; no special sites for markets and schools; no civic institutions independent of the palace.<sup>23</sup>

## Capitalism and Coketown

Industry brought more goods but not better living for the masses. Capitalism, until the state stepped in, widened the gulf between rich and poor. The workers grew poorer even in an absolute sense, above all in their housing. The splendour of the cities, with grand buildings and sumptuous villas, only added to the workers’ burden.

The baroque city is still with us, as in Paris, Vienna, or Berlin. Bankers and speculators did away with controls on expansion. When Major L’Enfant submitted his baroque plan for Washington D.C. in 1791, he did not foresee that even its good features would largely be negated by the speculators who would actually build the city. L’Enfant himself sacrificed the urban values of community to those of the baroque: space, movement, and magnificence.<sup>24</sup> To public buildings and spaces he allotted 541 acres; to private building, 1,964 acres; to highways, 3,606 acres (though there was in his day hardly any traffic). The baroque plan gave private traffic “a license to destroy the city.”<sup>25</sup> Only the automobile age could fill and overfill those grand avenues.

Money, credit and long distance trade led to a new view of life. In place of security came calculated risk. The Middle

---

## *Cities meet physical and social limits, either drowning in their wastes, succumbing to crime, or becoming targets in a giant self-destructing system.*

---

Ages had opposed and protected consumers. But the capitalist market became unlimited and abstract. Profit now outweighed security, stability, and equity. It either expanded the city into the suburbs, at the expense of nature, or built taller, more crowded structures, at the expense of the workers.<sup>26</sup> Profit had no place for personal ties and communal interests; it brought the end of guilds, community, and religious orders. It preached freedom from community restrictions and for private investment. Land too became not a stewardship but a commodity; it was no longer leased, as in feudal times, for ninety-nine or 999 years.<sup>27</sup> Of course, the Middle Ages had drawbacks. Its corporations upheld trade secrets and resisted innovations. They kept guild privileges for their own families and opposed the widening of markets. Capitalism, by contrast, brought in new designs like the knitting machine; it expanded trade beyond the controls of guild or city. Democracy spread, aided in part by technology: one’s dress, thanks to mass-produced clothes and ‘brummagem’ jewelry, no longer established one’s rank. But the costs were high, above all in the factory town — “Coketown”, as Dickens called it, also known as Smokeover or Mechanicsville. In Essen, Manchester, or Pittsburgh, such towns survived into our own century. At the town’s heart lay factories and gas tanks; around them, row on row of workers’ houses. No parks, gardens, or playgrounds — only mean streets and railroad yards, adding still more noise and dirt. Over all hung a pall of coal smoke, blotting out the sun, corroding the lungs.<sup>28</sup> As the jobless and landless streamed into the cities, their problems grew. This was the London of Oliver, Fagin, and Bill Sykes, with its poverty, crime, and prostitution.

Behind its growth lay the destruction of cottage industries, the eviction of farmers by enclosure, and the speculators’ quest for higher land prices through urban congestion. But new technologies also played a role. Windmills and waterwheels let workshops be dispersed; such “polytechnics” gave little advantage to bigness. But the steam engine helped the growth of

factories, for a single engine could run hundreds of machines. Factories five stories high now arose, filled with hundreds of workers. They needed cheap surplus labour, which only a large city could supply. In a country village, besides, industry would have been obliged to support the destitute. The new railways, further, could carry coal cheaply all year round. Since the trains could not climb steep gradients, cities near the coalbeds grew quickest, as in the Lille and Ruhr districts. Large port cities also grew faster than the smaller ports. Only ports like London, Antwerp, and Hamburg could handle the larger ships and finance the giant docks, cranes, and dredges needed to make ever larger profits.<sup>29</sup>

The industrial city believed in quantity, not quality. In Rotten Row, workers grew so used to ugliness they often would not move to cleaner, less crowded quarters.<sup>30</sup> So unhealthy was their life that the high priest of utility, Herbert Spencer, had to preach the gospel of play too. “He went so far as to make a special plea to parents to permit their children to *eat fruit*.”<sup>31</sup> People preferred canned goods to fresh, for calories alone counted. Even today we retain much of their ignorance of sunlight as a vitamin, or even as a bactericide. How many office workers live in virtual caves, with all-day fluorescent lighting and air conditioning? The ultimate city of the future, if nuclear experts have their way, will be underground: a permanent termite-like fallout shelter.<sup>32</sup>

## Renewing the City

More and more, Mumford doubted the value of piecemeal reform. His friend Frederick Osborn felt lower densities would solve many of the city’s problems. But Mumford felt that any state-sponsored reforms would only strengthen the anti-city. We must, he said, give up the very idea of growth. As he testified to the Ribicoff committee in 1967, Senator Ribicoff wanted a contradiction in terms: neighbourhood communities *and* the “technology of Megalopolis.” The Senator wanted to put fifty billion dollars into slum clearance. But such “urban renewal,” said Mumford, would only add to over-crowding, enrich speculators, and drive out the poor. It would bring in a kind of Aerospace Industry — “General Space Housing Incorporated” — to erect standardized, quickly obsolescent units.

Mumford spoke from experience. With Clarence Stein and Henry Wright, he had



*True cities, in contrast to the over-grown anti-cities of today, know balance. Cities like Siena still maintain the medieval tradition of corporate responsibility.*

kept alive the New Town idea since the 1930s; with Benton MacKaye, he had set forth in 1925 the ideas of regionalism and regional planning. When President Roosevelt began to espouse some of these ideas, Mumford took hope. But financial interests, bureaucratic in-fighting, and the bulldozer mindset turned the dream into nightmare — the urban jungle of high-rise housing. "In coming to life, our ideas were done to death."<sup>33</sup>

Reform must come at the local level. The New England Township and Town Meeting showed the way: they should have been made the democratic building block of the whole government. The United States Constitution made its greatest mistake in not doing this. "For democracy, in any active sense, begins and ends in communities small enough for their members to meet face to face."<sup>34</sup> The city needs limits — unity and self-containment, so it does not smother the country with formless urbanoid tissue.

An organic view affirms man's partnership with nature. Machines cannot replace nature. We must renew our oldest ties, to plants and animals, air and water, winter and summer. A world of humans alone is unfit for humans. The Mad Paver, despite his high-tech skills, is a defective human. City dwellers need "some chance to touch

and feel and cultivate the earth." A worldwide megalopolis would foster tyranny. The apostles of progress bring not just sterility to the country but death to the city itself. "Whether they extrapolate 1960 or anticipate 2060 their goal is actually '1984'."<sup>35</sup>

True cities, in contrast to the overgrown anti-cities of today, know balance. In its Golden Age, Athens united city and country, public and private life, citizens and the community. It united thought and action, as in Socrates the thinker and Sophocles the dramatist. What secret factor brought forth men like Aeschylus and Plato, Euripides and Themistocles? Though the Greeks sought it, from Plato to Isocrates, they failed to see the answer: the city. The polis was the school whose *paideia*, or education for wholeness, formed and transformed such men. The polis combined work and leisure, politics and art, intellect and adventure.<sup>36</sup>

### The Garden City as Social City

But how can we regain balance today? We can take as examples, says Mumford, those cities that retained the medieval tradition of corporate responsibility: smaller ones like Siena and Florence, but also large

ones like Amsterdam, Stockholm, and Frankfurt-am-Main. But we also need new towns, to reduce our overgrown ones to human scale. This is no utopian proposal. The Garden City idea, launched by Ebenezer Howard in 1898, has succeeded far better, says Mumford, than mechanist, growth-minded plans such as Edgar Chambless's Roadtown, Soria y Mata's "Linear City", or Le Corbusier's so-called "Vertical Garden City".<sup>37</sup> Howard, a practical visionary, saw the main features of a livable city and put them into practice. Unlimited growth, he noted, meant slower traffic, more distant institutions, longer commuting, and less access, for most citizens, to the city's culture.

Our large cities must be decentralized, not expanded into suburbia. The Greeks, believing in limits, did not expand the polis but founded colony-cities. They kept city and country in balance. No megalopolis gobbled up the surrounding farmland. Reviving this view, Howard showed a rational way of combining growth and stability, differentiation and order.

Is a Garden City a boring, sleepy hamlet? Not at all. Howard, like Mumford, was a child of the city. He rated social contact even higher than gardens, which also flourish in suburbia. But the Garden City's small size — Howard suggested 30,000



people as the ideal — would not hamper business and culture. Thanks to modern transport and communications, a cluster of such cities could form a "Social City". Ten of them would provide the same services as a city of 300,000, whether hospital, university, or symphony orchestra.<sup>38</sup>

But the city needs also to bring its technology down to the human scale. As Amos Rappoport points out, the very type of housing can be crucial to family and community stability.<sup>39</sup> The same applies still more to larger technologies: the mega-city with its systems of transport, education, business, and housing. The city is itself a container, like baskets, homes, and libraries. Containers, with their built-in stability, are just as important for culture as power machines. In fact, in our age of insensate dynamism they are even more important. Replace the slums with high-rise blocks? Tear down Paris (as Le Corbusier once proposed) and replace it with giant glass towers? Mumford is one of the greatest opponents of such "clean sweep" planning. A recent writer on the city claims Mumford wants to raze the city — betraying merely her own acceptance of the current razing of the human-scale city.<sup>40</sup> To escape the bulldozers and wrecking crews, we need thorough planning for thorough devolution, not more unplanned concentration and chaos.

Mumford suggests many measures to make the city a more livable and beautiful container: residential zoning, community parks, public transport, pollution and noise control, separation of motorways from walkways, back alleys as flower-bedecked walkways. A mix of ages, cultures, and professions could replace suburban uniformity. Larger blocks with a park or garden at their centres could replace the grid-style streets where cars endanger children's play and adults's talk.<sup>41</sup>

New technology can also help. Mumford believes Kropotkin was right in his book of 1899, *Fields, Factories, and Workshops*. We no longer have to depend on coal mine, railroad, and large factory for 'economies of scale'. Electric power and intensive, organic farming can let small units become as effective as large. New techniques of small-scale farming can break the urban monopoly on science, culture, and dynamism. The electric grid can replace the coal train. Rapid transit and communications can overcome the gulf between city and country. Kropotkin's vision gains still greater weight with the advent of the car, radio, motion picture, telephone, and television.<sup>42</sup>

Mumford, in short, argues there is a way

back from the concrete jungle to a green world. It requires both social and technical steps — both planning and invention. Real community requires small, democratic tools as well as small social groups.

But against mechano-utopians, Mumford thinks the human factor more important than the technical. He cites Hong Kong as an example. There, he says, over five million live in the worst kind of crowded, high-rise tenements. While parents work all day, young children are locked in the tiny flats. Why then have they far less domestic strife and delinquency than in America's low-income housing? For two reasons, Mumford feels: the cult of the family gives the parents authority and responsibility, while both young and old must do serious work every day. We must rethink, he says, the question of child labour. "To protect the young from over-idleness has now become as important as it was once to protect them from over-work."<sup>43</sup> In America's past, too, immigrant groups escaped social breakdown because of Old World village loyalties, family bonds, and religious precepts. Moral soundness can cope even with slum conditions.

### The Limits of Knowledge

Three decades have passed since Mumford wrote *The City in History*. Have they taught us anything more? Two things, I suspect: that both the myth and the ignorance born of the city may be greater than he thought. Despite the growing idiocy of urban life, many are still as trapped as Mumford in 1917 by its "power and beauty". Whether Babylon or New York, the city is still home of the gods, with an opulence and dynamism that make nature itself seem boring. But the mega-city leads to ignorance as well as illusion. Can even our experts understand it? Leading thinkers still extol it: the Harvard philosopher Morton White says we cannot limit its growth; the Harvard sociologist Daniel Bell says we will gain still more wealth and progress from it; the Harvard theologian Harvey Cox says we should welcome its speed, power, and anonymity.<sup>44</sup> Most scholars rank Jane Jacobs's views on the city as highly as Mumford's; even Mumford's official biographer calls Mumford's attack on Jacobs "condescending".<sup>45</sup> How then can the mere layman know who is right? Even Mumford failed to see the whole problem, for instance by playing down population growth.

The larger the system, after a point, the less we understand it. Large machines and organizations, as Charles Perrow shows, are bound to break down in ways we cannot foresee.<sup>46</sup> Two factors make them vulnerable: complexity and coupling. The more complex their parts, the more accidents will become 'normal'. The more tightly coupled their parts, the more a single malfunction will bring the whole to a halt. Organizations, unlike machines, are loosely coupled; their breakdown takes longer than meltdowns or blackouts. But their complex parts interact in obscure, unforeseeable ways.

The large city, I suspect, forms such a mega-system. We try to solve its puzzles in various ways. One is by simple denial: "The system must be safe, or I wouldn't be here". Another is safety devices: more police, rent control, or clean air boards. But safety measures can lead to further complexity as well as complacency. By fixing our eyes on known risks, they distract from the little known (like incoming H-bombs). Today we need a still deeper awareness of limits. The Austrian philosopher Gunther Anders, pointed the way with a further insight about large machines: they rule out learning by experience. We cannot really 'test' our nuclear arsenal, said Anders: the experimenter would go up with the experiment. "The laboratory has become the world."<sup>47</sup>

The same logic applies, I suspect, to computer programmes, the stock market, or the economy; to complex, interactive pollutants, from smog to Thalidomide; and to social systems like the giant city. How many car drivers grasp the deeper causes even of a traffic jam? Faced with such mega-systems, do the experts comprehend even one another? Jane Jacobs seems to miss Mumford's whole position on organic versus mechanist planning. She blithely equates the Garden City of Howard and Mumford with the 'Vertical Garden City' of Le Corbusier. In her eyes, Mumford is only a "decentrist", wanting more grass and less people: "If the great object of city planning was that Christopher Robin might go hoppety-hoppety on the grass, what was wrong with Le Corbusier?"<sup>48</sup> Her own simplistic solution: more people, less grass. No wonder Mumford was at his most slashing in his superb *New Yorker* article, "Mother Jacobs' Home Remedies for Urban Cancer".<sup>49</sup>

Despite his understating of the limits even of our understanding, Mumford remains our best guide to the city. Many recognized this even in the age of Ronald Reagan. In April, 1988, the State Univer-

sity of New York at Albany established "The Lewis Mumford Center for Comparative Urban and Regional Research". Governor Mario Cuomo, who might have been America's president had he campaigned, paid Mumford glowing tribute. "Your books and articles", said Cuomo, "on cities, on architecture and on technological change, and above all your more than thirty years of writing the marvelous 'Sky Line' column in *The New Yorker*, have shown you to be an unfailing critic of the superfluous, the absurd, the ugly and the pursuit of narrow sectarian interests. In your own lifestyle, you have exemplified modesty, freedom from ostentation and mass consumption, and the integration of rural and urban values."<sup>50</sup>

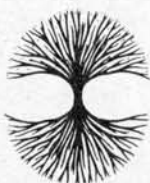
Would that other leaders were taking Mumford's warnings to heart. In the plight of our cities, Mumford sees a parallel to the finest polis, Athens. For a hundred years, from Solon to Pericles, Athens flourished. But with the Persians defeated, and the city's wealth and power at their peak, Athens began to put buildings in the place of men. Behind the Parthenon's splendour, says Mumford, lay spiritual decay. Pericles financed it through terror and injustice in the cause of empire. Aesthetically flawless, the Parthenon shows moral weakness: in its frieze the people moving toward the temple revere their totem bird, the owl — the self-admiring self that gazes on itself. "God, city, and citizens became one compact manifestation of ego."<sup>51</sup>

Diverted by sports, shows, and fine cooking, the citizens made no sacrifices for the future. Beneath the city's rouge and perfume lay a waxen corpse. Even Socrates succumbed to the city's spell: he said only "men in the city", and nothing in nature, could teach him.<sup>52</sup> Athens dreamed of empire, warred with Sparta, and succumbed to the Spartan-Persian alliance. A parable for our own day, says Mumford. Arrogance and ignorance go together: the city that forgets its limits loses its reason. History began with a city that was a world; it ends with a world that is becoming a city. Only if we can limit the city, restoring balance with nature and all life, has it a future.

#### References:

1. L. Mumford, *Sketches from Life*, Dial Press, New York, 1982, 139ff. On this "epiphany" see the perceptive comments of Frank G. Novak, *The Autobiographical Writings of Lewis Mumford*, University of Hawaii, Hawaii, 1988, 8-11.
2. L. Mumford, *The City in History*, Harcourt, New York, 1961.
3. J. Jacobs, *The Economy of Cities*, Cape, London, 1970, 118.
4. A. Toffler, *Future Shock*, Pan, London, 1964.
5. L. Mumford, op. cit., supra 2, 525ff.
6. J. Jacobs, *The Death and Life of Great Cities*, Cape, London, 1962, 21.
7. A. Ravetz, *Remaking Cities*, Croom Helm, London, 1980, 55.
8. J. Jacobs, op. cit., supra, 6, 20.
9. L. Mumford, *The Culture of Cities*, Harcourt, New York, 1938, 272-279.
10. L. Mumford, op. cit., supra 9, 283-292.
11. L. Mumford, op. cit., supra 9, 284.
12. L. Mumford, op. cit., supra 9, 292.
13. L. Mumford, op. cit., supra 2, 219.
14. L. Mumford, op. cit., supra 2, 228.

15. L. Mumford, op. cit., supra 2, 230.
16. L. Mumford, op. cit., supra 2, 292.
17. L. Mumford, op. cit., supra 2, 299.
18. L. Mumford, op. cit., supra 2, 297.
19. L. Mumford, op. cit., supra 2, 258.
20. L. Mumford, op. cit., supra 2, 251.
21. L. Mumford, op. cit., supra 2, 375.
22. L. Mumford, op. cit., supra 2, 368.
23. L. Mumford, op. cit., supra 2, 394.
24. L. Mumford, op. cit., supra 2, 404.
25. L. Mumford, op. cit., supra 2, 408.
26. L. Mumford, op. cit., supra 2, 413.
27. L. Mumford, op. cit., supra 2, 416.
28. L. Mumford, op. cit., supra 2, plate 11.
29. L. Mumford, op. cit., supra 2, 157-160.
30. L. Mumford, op. cit., supra 2, 466.
31. L. Mumford, op. cit., supra 2, 469.
32. L. Mumford, op. cit., supra 2, 481.
33. L. Mumford, *The Urban Prospect*, New York, Harcourt, 1968, p. 214.
34. *ibid*, 224.
35. L. Mumford, op. cit., supra 2, 527.
36. L. Mumford, op. cit., supra 2, 169.
37. L. Mumford, op. cit., supra 2, 519.
38. L. Mumford, op. cit., supra 2, 520.
39. A. Rappaport, 'The Ecology of Housing', *The Ecologist*, Vol. 3, No. 1, 1973.
40. A. Ravetz, op. cit., supra 7.
41. Michael R. Hughes (ed.), *The Letters of Lewis Mumford and Fredrick J. Osborn*, Adam and Dart, Bath, 1971, 277-278. Donald L. Miller, *The Lewis Mumford Reader*, Pantheon, New York, 1968, 158 and 203ff.
42. L. Mumford, op. cit., supra 2, 514.
43. L. Mumford, op. cit., supra 33, 253.
44. Harvey Cox, *The Secular City*, SCM Press, London, 1965.
45. Donald L. Miller, op. cit., supra 41.
46. Charles Perrow, *Normal Accidents*, Basic, New York, 1984.
47. Gunther Anders, *Die Antiquiertheit des Menschen*, Munich, C.H. Beck, 1956.
48. J. Jacobs, op. cit., supra 8, 22.
49. L. Mumford, op. cit., supra 33, 182-207.
50. Letter of Governor Cuomo to Mumford, April 8, 1988.
51. L. Mumford, op. cit., supra 2, 147.
52. L. Mumford, op. cit., supra 2, 170.



## THE GREEN COLLEGE

The Green College is a new, independent, international residential higher education college which has been established to promote ecocentric values through teaching, research and networking. It is a non-profit making institution. It also works for changes aimed at creating a more sustainable, democratic and egalitarian society. The college runs general interest courses, training courses and credit-earning courses. Forthcoming courses include the following:

**30 July — 6 August**  
**7-8 October**  
**21-22 October**

**ENVIRONMENTAL POLITICS AND THE GREEN MOVEMENT IN BRITAIN**  
**GREEN PARTIES IN EUROPE: CHALLENGES AND OPPORTUNITIES**  
**LEARNING FROM EUROPE AND THE UNITED STATES: ENVIRONMENTAL PROTECTION IN COMPARATIVE PERSPECTIVE**  
**THE CRISIS IN AGRICULTURE AND ALTERNATIVE FARMING METHODS**  
**THE NEW ECONOMICS: CRITICAL PERSPECTIVES.**

**COST:** Weekend courses are £50 on a residential basis and £35 on a non-residential basis. Reductions on application.

**COURSE DIRECTOR:** Peter D. de la Cour

*Co-Director of The Green College and Senior Lecturer in Sociology at the City of London Polytechnic. A number of distinguished visiting lecturers will also be participating.*

The Courses will take place at Malvern, Worcestershire. Course participants will stay at Birchwood Hall Conference Centre. Birchwood Hall is a 20 member strong commune, delightfully centred in the Malvern Hills. Lectures and seminars will take place at nearby Pickersleigh Court, a beautiful 17th century country house.

**DETAILS FROM:** The Green College, Pickersleigh Court, Malvern, Worcestershire, WR14 2ET, England. Tel: (0865) 249020. London Office: 01-674-0763.



# Development, Poverty and the Growth of the Green Movement in India

by

Jayanta Bandyopadhyay and Vandana Shiva

*Market-orientated development models take no account of the needs of "Nature's economy". Resource-intensive development inevitably undermines the productivity of natural systems and benefits the few at the expense of the mass of humanity. The ecological movements that have arisen in India are a direct response to the current development debacle. They do not seek "greener" economic growth, but rather the rejection of market economics.*

A characteristic of Indian civilization has been its sensitivity to natural ecosystems. Vital renewable natural resources, like vegetation, soil, water and air, were managed and used according to well-defined social norms that respected known ecological processes. Indigenous cultures were sensitive to the limits to which natural resources could be exploited. It is said, for example, that the codes of conduct for pilgrims visiting such important religious centres as Badrinath in the Himalayas included a maximum stay of one night so that the temple area would not put excess pressure on local natural resources.

Before the pre-colonial era, indigenous economic processes placed few demands on natural resources and the impact of economic activity was too low to result in drastic environmental problems. Social norms, which applied to commoners and kings alike, safeguarded the environment and the destructive use of resources invariably met with public protest.

The advent of the British brought a major change in the pattern and nature of resource use. Instead of being used to satisfy local needs, the natural wealth of India was exploited to meet the demands of western Europe. Natural resources, like water, forests, minerals, etc, which had traditionally been managed as commons were taken over by the colonial authorities. Large areas of land were taken over to supply the raw materials for the British textile industry — the flagbearer of the industrial revolution. In Bengal and Bihar, peasants were forced to cultivate indigo; in Gujarat and the Deccan, cotton. Forests in the sensitive mountain ecosystems of the Western Ghats and the Himalayas were felled to build battle-ships or to meet the requirements of the expanding railway network, wood from the forests of the Bengal-Bihar-Orissa region being used to fuel the first locomotives. In the final stages of colonial rule, control over the use of resources was so complete that even water supplies were monopolized, access to such water sources as Sambhar lake in Rajasthan or the Damodar canal in Bengal being severely restricted.

Colonial intervention in the management of India's natural resources led to conflicts over such vital renewable resources as water and forests and induced new forms of poverty and depri-

vation, resulting in several protest movements as local people sought to regain — and retain — control over their natural resources. Such movements included the Indigo movement in eastern India; the Deccan movement for land rights; and forest movements in the Western Ghats, the central Indian hills and the Himalayas.

With the collapse of colonial rule internationally, and the emergence of sovereign independent states throughout the Third World, the conflicts over the control over local resources could have been resolved. But, in India as elsewhere, political independence vested the control over natural resources with the state. External colonialism may have ended but the new quest for "economic development" ensured that the colonial framework of natural resource management remained essentially unchanged. The same institutions which had been nurtured and developed by the colonial rulers with the specific aim of ensuring the permanent occupations of the colonies and the undermining of the local "natural economy"<sup>1</sup> were now entrusted with the responsibility of satisfying the basic needs of local people. That the nature of the institutions — and the ideology that lay behind them — made this goal impossible was never given serious thought.

## Ghandi: Exploding the Myth of Resource-Intensive Development

The inexorable logic of resource exploitation, exhaustion and alienation integral to classical models of economic development based on resource-intensive technologies led Ghandi to seek an alternative path of development for India. He wrote:

"God forbid that India should ever take to industrialism after the manner of the west. The economic imperialism of a single tiny island kingdom (England) is today keeping the world in chains. If an entire nation of 300 million took to similar economic exploitation, it would strip the world bare like locusts."<sup>2</sup>

Ghandi's critique gave advance warning of the future problems attendant on following the classical path of resource-intensive development. But at the time of Independence, no clear and comprehensive plan for realizing the Ghandian alternative for a resource-prudent development strategy, aimed at satisfying

---

Jayanta Bandyopadhyay and Vandana Shiva are two of India's leading ecological thinkers. They can be contacted at: 105 Rajpura Road, Dehradun 248001, Uttar Pradesh, India.

---

*"The positive feature of India's growing ecological movement lies in the manner in which it makes visible the invisible externalities of development and reveals its inherent injustice and non-sustainability."*

---

basic needs, existed. The issue of resource constraints on economic development were scarcely discussed, partly due to the tremendous pressure to "develop" that arose from the enhanced aspirations of a newly independent nation, and partly because natural resource parameters did not feature within the framework of conventional economics.

As the scale of economic development activities escalated from one five-year plan to another, the disruption of the ecological processes that maintain the productivity of the natural resource base started becoming more and more apparent. The classical model of economic development resulted in the growth of urban-industrial enclaves where commodity production was concentrated, as well as the rapid exhaustion of those "internal colonies" whose resources supported the enhanced demands of these enclaves.

The pressure to relieve poverty accelerated the pace of development — but instead of living standards improving for the mass of people, poverty simply increased. The commercialization of forestry provides a case in point. Commercial forestry companies increased their revenues by making more timber and pulpwood available in the market, but in the process they reduced biomass productivity or damaged the hydrology of the forest. People dependent on the non-timber biomass outputs of the forests like leaves, twigs, fruits, nuts, medicines, oils, etc., were thus unable to sustain themselves. The changed hydrological regime of the forests affected both the micro-climate and the stream flows, disturbing hydrological stability and affecting agricultural production. There are similar examples from all parts of the country, related to almost all the massive developmental interventions in India's natural resource systems.

The ecological degradation and economic deprivation generated by the insensitivity and intensity of resource use resulted in environmental conflicts, an understanding of which is necessary for the reorientation of our current development priorities and concepts. Increasingly, it is becoming clear that the educated minority elite is the main beneficiary of the "development" process. In the context of a limited resource base and unlimited development aspirations, the ecology movements have initiated a new politics for safeguarding the interests and survival of the poor and the marginalised, among whom are women, tribals and poor peasants.

### **Ecology Movements: Pressing for Survival**

The number and range of ecology movements in independent India have increased as the predatory exploitation of natural resources to feed the process of development has intensified. This process has been characterized by the huge expansion of energy and resource-intensive industrial activity and by major development projects, such as big dams, forest exploitation, mining, energy-intensive agriculture, etc. The resource demand

of development has led to the narrowing down of the natural resource base for the survival of the economically poor and powerless, either by the direct transfer of resources away from basic needs or by the destruction of the essential ecological processes that ensure the renewability of life-supporting natural resources.

The ecology movements arose as the peoples' response to the new threat to their survival and in order to demand the ecological conservation of vital life-support systems. Beyond clean air, the most significant of these systems are the common property resources of water, forests and land, on which the majority of the poor people of India depend for survival.

Among the various ecology movements in India, the Chipko movement (see *The Ecologist*, Vol. 17, No. 1) is the best known.<sup>3</sup> It started as a movement of the hill people in the state of Uttar Pradesh to save the forest resources from exploitation by contractors from outside. It later evolved into an ecological movement that was aimed at the maintenance of ecological stability in the major upland watersheds of India. Spontaneous popular resistance to save vital forest resources took place in the Jharkhand area on the Bihar-Orissa border region, as well as in the Bastar area of Madhya Pradesh where there were plans to convert the mixed natural forests to plantations of commercial tree species, to the complete detriment of the local tribal people. In the southern part of India, the Appiko movement, which was inspired by the success of the Chipko movement in the Himalayas, is actively involved in stopping illegal felling of the forests and in replanting forest lands with multi-purpose broadleaved tree species. In Himachal Pradesh, Chipko activists have concentrated their opposition on the expansion of the monoculture plantation of commercial chir pine (*pinus roxburghii*). In the Aravalli hills of Rajasthan, there has been a massive programme of tree planting to give employment to those hands which were hitherto engaged in felling trees.

The exploitation of mineral resources, in particular open-cast mining in the sensitive watersheds of the Himalayas, the Western Ghats and central India, have also caused a great deal of environmental damage. As a result, environmental movements have arisen in these regions to oppose the mining operations. Most successful among them is the movement against limestone quarrying in the Doon Valley in Uttar Pradesh. Here the volunteers of the Chipko movement have led thousands of villagers in peaceful resistance against the limestone quarries which are seen by the people as a direct threat to their economic and physical survival.<sup>4</sup>

While popular opposition to quarrying in the Doon Valley has a long history, and a major Supreme Court order has restricted the area of quarrying to a minimum, examples of such successes are rare.<sup>5</sup> Popular ecology movements against mineral exploitation in neighbouring Almora and Pithoragarh still seem to be ignored, probably due to their relative geographical isolation. Beyond the Himalayas, the movement in the Ghandhamardan hills in Orissa



---

*"The ideology of development equates development with economic growth, economic growth with expansion of the market economy, modernity with consumerism and non-market economics with backwardness."*

---

against the ecological havoc of bauxite mining has gained momentum. The Bharat Aluminium Company (BALCO) mining project in the Gandhamardan hills is being opposed by local youth organizations and by tribal people whose survival is directly under threat. The peaceful demonstrators have claimed that the project could be continued only "over our dead bodies".<sup>6</sup> The situation is more or less the same in large parts of the Orissa-Madhya Pradesh region, where rich mineral and coal deposits are being opened up for exploitation and thousands of people are being pushed into destitution. This region includes the coal mining areas around the energy capital of the country in Singrauli (see *The Ecologist*, Vol 19, No. 2). In these interior areas of central India, movements against both mining and forestry are increasing and popular resistance is growing.

## **Opposition to Water Projects**

Large river valley projects, the numbers of which are rapidly increasing in India, are another group of development projects against which ecology movements have arisen. The large scale submersion of land, a prerequisite for these projects, invariably takes a heavy toll on dense forests and the best food-growing areas. Such areas have been usually provided the material basis for the survival of a large number of people, especially tribals. The Silent Valley dam project in Kerala was opposed by the ecology movement on the grounds that it was a threat, not to the survival of the people directly, but to the gene pool of the tropical rain forests threatened with submersion. The movement against the Tehri high dam in Uttar Pradesh in the Himalayas exposed the possible threat to the people living both above and below the dam site through large-scale destabilisation of land by seepage and by the strong seismic movements that could be induced by impoundment. The Tehri Dam opposition committee has appealed to the Supreme Court against the proposed dam on the grounds that it threatens the survival of all the people living near the river Ganges up to West Bengal.<sup>7</sup> Popular movements have also emerged against dams at Bedthi, Inchampalli, Bhopalpatnam, Narmada, Koel-Karo and Bodhghat.<sup>8</sup> In the context of already overused land resources, the proper rehabilitation on a land-to-land basis of millions of people displaced through the construction of dams seems impossible.<sup>9</sup> The cash compensation given instead is inadequate in all respects for providing an alternate livelihood for the majority of the displaced. Destitution is thus the first and foremost precondition for starting large dam projects.

While the process of the construction of the dams itself invites opposition from ecology movements, the functioning of the water projects dependent on the dams goes on to create further ecological disasters. Popular movements against widespread water-logging, salinisation and resulting desertification in the command areas of many dams have been growing. Among the

projects which have spawned ecological protest are those at Tawa, Kosi, Gandak, Tungabhadra, Malaprabha, Ghatprabha, and the canal irrigated areas of Punjab and Haryana. Elsewhere, in the arid and semi-arid regions of India, the improper and unsustainable use of water has also generated ecology movements. The anti-drought and anti-desertification movement is becoming particularly strong in the dry areas of Maharashtra, Karnataka, Rajasthan, Orissa, etc. Ecological water use for survival is being advocated by movements like Pani Chetana, Pani Panchayat and Mukti Sangharsh.<sup>10</sup>

Another major movement, which is spreading along the 7,000 km coastline of India, is the movement of small fishing communities against the destruction caused by mechanized fishing, the instant profit motive of which is destroying the long term biological productivity of the coasts.

No account of the threat to survival in India from environmental hazards can be complete without a reference to the Bhopal tragedy. Several thousand people died and several hundreds of thousands were affected by the poisonous gas released by the explosion at the Union Carbide plant. A popular movement for clean air and water is now growing throughout the country in reaction to this disaster.

## **Development and the Dispossessed**

Though the ecology movements relate to issues that are geographically localised, like forests or water pollution, their reverberations are national and even global in import. This macro-micro dichotomy results from the existence of "the two Indias".<sup>11</sup> Development activities invariably have a need for natural resources. In the context of limited quantities of resources, (limited either by non-renewability or by ecological limits to renewability), the resource needs of the two Indias are bound to compete with each other. In this unequal competition, the survival of the less powerful but more populous micro-economy is directly threatened. This threat may come either by resource transfer or by resource degradation.

Yet the significance of the ecology movements does not merely lie in the fact that they are voices for the dispossessed who are the victims of the highly unequal sharing of the costs of the development process. The positive feature of these movements lies in the manner in which they make visible the invisible externalities of development and reveal its inherent injustice and non-sustainability. The recognition of these inadequacies, and the imperatives arising from the right to survival, creates another direction for development which ensures justice with sustainability, equity with ecological stability.

The ecology movements can no longer be considered flash-in-the-pan protests. They are an expression of the universal socio-ecological impacts of a narrowly conceived development strategy based only on the short-term commercial criteria of exploi-

tation. The impact of ecology movements cannot be assessed merely in terms of the impact of the particular development projects they originate from. The impact in the final analysis is on the very fundamental categories of politics, economics, science and technology which together have created the classical paradigm of development and resource use. The emerging threat to survival arising from the development process demands a re-evaluation not just of some individual projects and programmes which have been shown to be ecologically destructive, but of the very conception and paradigm of development that generates such projects. The ecology movements are revealing how the resource-intensive demands of current development have ecological destruction and economic deprivation built into them. They are also stressing that the issue involves not merely a trade-off of costs and benefits, because the cost of destruction of the conditions of life and well-being is not merely a matter of money, it is a matter of life itself. The most important and universal feature of ecology movements is that they are redefining the concepts of development and economic values, of technological efficiency, of scientific rationality - they are creating a new economics for a new civilization.

## Growth against Survival

The ideology of the dominant pattern of development derives its driving force from a linear theory of progress, from a vision of historical evolution created in eighteenth and nineteenth century Western Europe and universalised throughout the world especially in the post-war development decades. The linearity of history pre-supposed in this theory of progress created an ideology of development that equated development with economic growth, economic growth with expansion of the market economy, modernity with consumerism and non-market economics with backwardness. The diverse traditions of the world, with their distinctive technological, ecological, economic, political and cultural structures were driven by this new ideology to converge into a homogeneous monolithic order modelled on the particular evolution of the west.

## Rostow's Stages of Growth

Rostow's "stages of economic growth" are the clearest articulation of these assumptions. Rostow presents changes as taking place in three stages. The first stage consists of traditional society:

"whose structure is developed within limited production functions, based on pre-Newtonian science and technology and on pre-Newtonian attitudes towards the physical world . . . The central fact about the traditional society was that a ceiling existed on the level of attainable output per head."<sup>12</sup>

The totality of development experiences, however, does not reflect this simple linearity and stage-by-stage evolution. The interrelationship between resources within the same ecosystem, as well as the interlinkages between economic activities in different sectors of society, makes the economic development process more complex and multidimensional. Viewing the world as an ecologically interrelated whole leads to a concept of development that puts a premium on maintaining ecological balance and integrity, while satisfying basic human needs. In this context the "backwardness" and "low productivity" of non-western societies is based on recognizing productivity only in the

context of commodity production. The "high productivity" of the latter similarly has been based on a narrow and specific interpretation of productivity.

The resource intensity of modern production processes, geared towards profit maximisation in the absence of the awareness of other forms of productivity, leads to ecological deterioration and loss of resource productivity, which remain hidden externalities in development economics. The internalisation of such negative externalities over a large temporal and spatial horizon, in many instances, renders the "high productivity" processes extremely unproductive.

Rostow's second stage of development originates from a misleading representation of the material foundations of the visible and formal development process. Modernisation and economic growth based on resource-intensive processes compete for the same resources that are required for the satisfaction of basic survival needs, either directly, or through the destruction of the ecological functions performed by the resources. The second stage is clearly not a temporary co-existence of two unrelated sectors, namely, the "dynamic and progressive" and the "stagnant and backward" traditional. There is a distinct relationship between these two sectors in that the "dynamism" of the modern is fuelled by a continuous and unequal resource flow from the traditional. The growth and productivity of the modern feeds upon impoverishing the traditional. In the context of absolutely unequal sharing of the cost of economic growth, visible development accrues to the privileged while invisible underdevelopment accrues to the dispossessed.

The Rostownian approach assumes that in the process of development "the economy exploits hitherto unused resources", which is true in the case of resource abundance. However, in the present context, vital natural resources are all scarce and have a number of competing requirements and demands on them. The diversion of resources otherwise needed for human survival or for safeguarding ecological processes remains invisible in the accepted methods of economic accounting. Thus, in the context of the conflicting demands on scarce resources, economic growth leads to economic polarisation and not to universal prosperity. The rapid growth of the ecology movement is a symptom of this polarisation and a reminder that natural resources play a vital role in survival. The underdeveloped societies are not those that are yet to be affected by growth and development, as the dual sector model supposes. In reality, underdevelopment takes place because the gains of growth accrue to one section of the society or nation and the costs, economic or ecological, are borne by the rest.

The ecological relationship of the growth of affluence for a few regions and some people, on one hand, and the collapse of the resource base for survival for many, on the other, clearly contradicts Rostow's notion of the third stage of take-off in which "old blocks and resistances" are overcome and the prosperity of the enclaves becomes persuasive throughout society. The impoverishment of the peripheries and the erosion of the resources and rights of marginal communities actually pays for the material basis of the prosperity of the enclaves. This prosperity can neither be reproduced for regions and peoples whose impoverishment and deprivation are rooted materially and ecologically in the same process of growth, nor can the enclavisation process be sustained. The new poverty and dispossession create new "blocks and resistances" to the diffusion of the development process, making enclave development and underdevelopment of the hinterland a permanent feature of the development processes.

From within the societies and nations getting the advantages of



resource use, Rostow's take-off stage can be seen as reality. When one sees the process of development from the perspective of those who are underdeveloped as a result of its resource intensity, the "take-off" often gets translated to a "roll-down" into underdevelopment or ecological disasters. Indeed, it was the geographical separation of the regions benefitting and the regions losing in the process that primarily led to the superficial impression that economic growth takes place in an absolute sense. This impression was used to universalize Rostow's model for all countries, all people and all historical periods and this became the ideology of development.

## Market Economics Versus the Economics of Nature and Survival

The dominant ideology of development has been classically concerned only with the use of natural resources for commodity production and capital accumulation. It ignores the resource processes that are responsible for regenerating natural resources. It also ignores the vast resource requirements of the large number of people whose needs are not being satisfied through market mechanisms. The neglect of these two vital economies — the economy of natural resources and natural processes and the economy of survival — has been the reason why ecological destruction and the threat to human survival have remained hidden negative externalities of the development process.

The words ecology and economy have emerged from the same Greek word "oikos" or the household. Yet in the context of market-orientated development they have been rendered contradictory. "Ecological destruction is an obvious cost for economic development," the ecology movements are told. Natural resources are produced and reproduced through a complex network of ecological processes. Production is thus an integral part of the economy of nature but today the concepts of production and productivity have been exclusively identified with industrial production for the market. Organic productivity in forestry or agriculture has also been defined narrowly in terms of marketable produce alone. This has resulted in vast areas of resource productivity — like the production of humus by forests, the regeneration of water resources, or the natural evolution of genetic products — remaining beyond the scope of economics.

Similarly, modern economic theory and current concepts of development ignore the greater part of the history of economic production. For thousands of years, the "survival economy" has enabled human societies to derive their livelihoods directly from nature. Sustenance and the satisfaction of basic needs are the organizing principles behind natural resource use in the survival economy. By contrast, the exploitation of resources in the market economy rests on profits and capital accumulation.

While the diversion of resources, like the diversion of land from multipurpose community forests to monoculture plantations of industrial tree species, or the diversion of water from staple food crops and drinking water needs to cash crops, are frequently proposed as programmes for economic development in the context of the market economy, they create economic underdevelopment in the economies of nature and survival.

It is to these threats to survival that the growing ecological movement is opposed. Thus, in the Third World, ecology movements are not the luxury of the rich but are an imperative for the majority of the people whose survival is not taken care of by the market economy but is threatened by its expansion.



*Canals and irrigation works have been built throughout the Indian sub-continent and have brought widespread ecological disruption. In particular, they have led to waterlogging, salinisation and conflicts over water rights. Popular movements against such projects have grown up in many parts of the country. (Photo:Valdes)*

## Technological Choice and Holistic Ecology

Perceived from within the framework of the market economy, technology is assumed to lead to control over larger and larger quantities of natural resources, thus turning scarcity into abundance and poverty into affluence. Technology, accordingly, is viewed as the motive force for development and the vital instrument that guarantees freedom from dependence on nature. The affluence of the industrialized west is assumed to be associated exclusively with this capacity of modern technology to generate wealth.

Most resource-intensive technologies operate in urban enclaves, with enormous amounts of various resources coming from diverse ecosystems which are normally far away. This indirect and spatially diffuse process of resource transfer is made possible by energy-intensive long-distance transportation and leaves invisible the real material demands of the technological processes of development.

The spatial separation of resource exhaustion and the manufacture of products has also considerably shielded the tendencies of modern technologies to create inequalities. Further, it is simply assumed that the benefits of economic development based on these modern technologies will automatically percolated down to the poor and the needy, and that growth will ultimately take care of the problems of distributive justice. This would, of course, be the case, if growth and surplus were in a

---

*The visible enclaves of economic development get a disproportionately high access to resources whilst the invisible hinterlands of economic underdevelopment, the homes of the silent majority, are left with shrinking access to a shrinking resource base.*

---

sense absolute and purchasing power existed in all socio-economic groupings. This is not so, however. Surplus is often generated at the cost of the ecological productivity of natural resources or at the cost of exhausting the capital of non-renewable resources. For the poor, the only impact of such economic activity is the loss of their resource base and thus their livelihood.

It is, thus, no accident that the modern, efficient and "productive" technologies created within the context of growth in market economic terms are associated with heavy social and ecological costs. The resource and energy intensity of the production processes they give rise to demands ever-increasing resource withdrawals from the natural ecosystems. These excessive withdrawals in the course of time disrupt essential ecological processes and results in the conversion of renewable resources into non-renewable ones. A forest provides inexhaustible supplies of water and biomass, including wood, over time if its capital stock, diversity and hydrological stability are maintained and it is harvested on a sustained yield basis. The heavy and uncontrolled market demand for industrial and commercial wood, however, requires continuous over-felling of trees which destroys the regenerative capacity of the forest ecosystems and ultimately converts the forests to non-renewable resources. Sometimes the damage to nature's intrinsic regenerative capacity is impaired not directly by over exploitation of a particular resource but indirectly by the damage caused to other related natural resources. Thus, under tropical monsoon conditions, the over-felling of trees in the catchment areas of streams and rivers destroys not only forest resources, but also stable, renewable sources of water.

### **Distorted Concepts of Efficiency**

In the context of the market economy, the indicators of technological efficiency and productivity make no differentiation between the satisfaction of basic needs and the satisfaction of luxury requirements, or between resources extracted by ecologically sensitive technologies and ecologically insensitive ones. Indeed, economic growth *depends* on the production and consumption of non-vital products, thus leading to the further diversion of vital natural resources. For example, the water intensive production of flowers or fruits for the lucrative export market often results in water scarcity in low rainfall areas. The high powered purchasing capacity of the rich of the world can extract resources at the expense of resource scarcity and resulting conflicts for the poor.

Guided by a narrow distorted concept of efficiency and supported by subsidies of all types, technological change in the context of market-oriented development continues in the direction of intensive resource use, labour displacement and ecological destruction. The long-term continuation of such processes will lead to the destruction of the resource base of the survival

economy and to human labour being rendered dispensable in the production processes of the market economy.

### **The Market Push towards Ecological Destruction**

In the absence of a deeper understanding of the economy of natural processes and the survival economy, the critique of the market economy presented by the ecology movement is naively construed as a critique of development *per se*, technology *per se* and against any form of intervention in nature. Natural resource conflicts and ecological destruction are seen as separate from the economic crisis, and the proposed solution to the ecological crisis is seen to lie in the further expansion of the market system. As a result, instead of programmes of gradual ecological regeneration of natural resources, their immediate and enhanced exploitation with higher capital investment is prescribed as a solution to the crisis of survival. Mr. Clausen, when president of the World Bank, for example, recommended that "a better environment, more often than not, depends on continued economic growth".<sup>13</sup> In a more recent publication, Chandler (1986) further renews the argument in favour of a market-oriented solution for ecological problems and believes that concern for conservation can only come through the market.<sup>14</sup>

Such solutions are fundamentally flawed. To begin with, the global market economy has no internal mechanism for ensuring the ecological rehabilitation of the natural resources destroyed by the market itself. The costs of ecological destruction are left to be borne by the residents of the areas which have been destroyed, people who must participate in the survival economy on the same land. Under these conditions the market is incapable of responding to the requirements of the economy of nature and the economy of survival.

Secondly, calls for further growth are based on the assumption that the expansion of the market will lead to development and poverty alleviation. But what constitutes "poverty"? In the ideology of the market, people are defined as poor if they do not participate overwhelmingly in the market economy and do not consume commodities produced for and distributed through the market — even though they might satisfy those needs through self-provisioning mechanisms. They are perceived as poor and backward if they eat self-grown millets and not commercially produced, commercially distributed processed foods. They are seen as poor and backwards if they live in self-built housing from local natural resources, like bamboo, stone or mud instead of cement and concrete bought from a market. They are seen as poor and backward if they wear indigenous handmade garments of natural fibre instead of mechanically manufactured clothes made of man-made fibres.

Rudolph Bahro quotes an African writer who differentiates poverty and misery.<sup>15</sup> The "poverty" associated with non-western modes of consumption is often mistaken to be misery. Culturally perceived poverty is not materially rooted poverty or misery. Millets or maize, the common non-western staple, are nutritionally far superior to processed foods and are again becoming popular in the west as health foods. Huts built with local materials represent an ecologically more evolved method of providing shelter to human communities than concrete houses. Natural fibres and local costumes are far superior in satisfying the region-specific need for clothing than manufactured nylon and terelene clothing, especially in the tropical climate.

The new poverty that we see around the world is no longer



cultural and relative however. It is absolute, threatening the very survival of millions on this planet. At its root lies an economic paradigm which is governed by the forces of the market. It cannot assess the extent of its own requirements for natural resources, and it cannot assess the impact of this demand on ecological stability and survival. As a result economic activities that are most efficient and productive within the limited context of the market economy often become inefficient and destructive in the context of the economies of nature and survival.

The logic of the market by itself is not adequate to change the patterns of resource use that threaten ecological destruction and survival, especially in the context of independent nation states. Development as an ideology allows the indirect entry of global market domination. It creates a need for international aid and foreign debt which provide the capital for the development projects that commercialize or privatize resources. Control over local resources thus increasingly shifts from the hands of local communities, and even national governments, into the hands of international financial institutions. The conditions for loans determine the mode of natural resource use. The pressure of repayment and servicing of debts further consolidates the globalization. Total integration with the global market economy thus marginalizes the concern for the economy of natural processes and the survival economy. In the resulting anarchy of resource use, the visible enclaves of economic development with their elite minority residents get a disproportionately high access to resources and the invisible hinterlands of economic underdevelopment, the homes of the silent majority, are left with shrinking access to a shrinking resource base.

## Co-opting the Alternative Movement

The need for development that will improve standards of living, not undermine them, that will create ecological stability, not instabilities, is clear. The various dimensions of social movements, for survival, for democratic values, for decentralised decision-making are all components of the emerging ecology movement. While at the local level they may demand better management of forests in mountain catchments or better conservation of water in drought-prone areas, on the whole they are slowly progressing towards defining an alternate model for economic development — a new economics for a new civilization.

The agencies of the classical model of development have responded by turning 'environmental' overnight, and an attempt at co-option has begun. The time for the ultimate battle between the traditional concepts of development and the new ecological development paradigm is drawing nearer. The new packaging of old development model is characterized by purloining the language of the ecological movement to dress up old development programmes guided by the market and biased in favour of those who already enjoy economic superiority. New forestry programmes, for example, are being handed over to the NGO sector, as if leaving matters to the NGOs means a new conceptual framework for development. It is forgotten that so long as the development programmes are framed within the limits of the market economy and do not internalize the economy of natural processes and the economy of survival, the results cannot be different. The fundamental difference between hollow, decorative environmentalism and deep ecology must be understood because a new contradiction is being created to confuse the critics of market-oriented development.

Protagonists of hollow environmentalism argue that deep ecological arguments can wait: what cannot wait is instant environmental action. In this way much of the activism of the ecology movement is being frittered away in micro-level actions while their challenges at the macro-conceptual level get diffused. The task of the ecology movements is to face both challenges in a co-ordinated manner.

The issue is not simply one of planting trees here or protecting a tiger there. The issue is related to a fundamental change in human concepts about life, about development, about civilization. It is time that the old development strategy be replaced by a new one based on a holistic principles. It is on the ecology movements of the world that the task of evolving humane and sustainable development policies has fallen.

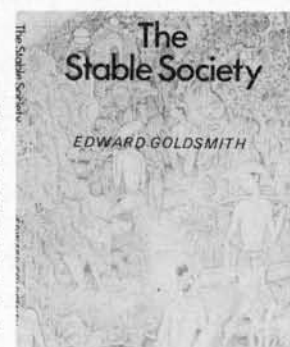
Acknowledgement: This article first appeared in *The Economic and Political Weekly*, India.

## References:

1. R. Luxemburg, *The Accumulation of Capital*, Routledge and Kegan Paul, London, 1951, 370.
2. M.K. Gandhi, *Young India*, December 20 1928, 422.
3. J. Bandyopadhyay and V. Shiva, 'Chipko: Rekindling India's Forest Culture', *The Ecologist*, Vol. 17, No. 1, 1987, 26-34.
4. V. Shiva, 'How Green was My Valley', *The Illustrated Weekly of India*, October 21 1986: see also, S. Jain, *Hindustan Times*, December 11 1986.
5. J. Bandyopadhyay and V. Shiva, 'Conflicts over Limestone Quarrying in Doon Valley', *Environmental Conservation*, Vol. 12, No. 2, 131-139.
6. Usha Rai, *The Times of India*, December 28 1986.
7. Usha Rai, *The Times of India*, September 9 1986.
8. Medha Paktar, *The Times of India*, December 11 1986: see also, A. Gandhi and A. Kumar, *Economic and Political Weekly*, Vol XXI, No 22, May 31 1986.
9. J. Bandyopadhyay in Edward Goldsmith and Nicholas Hildyard (eds.), *The Social and Environmental Effects of Large Dams*, Volume 2, Wadebridge Ecological Centre, 1985, 209-213.
10. Gail Omvedt, *Economic and Political Weekly*, Vol. XXI, No. 18, 1986: see also, B. M. Parandare, *The Times of India*, September 17 1986.
11. R. Kothari, *Dossier of International Foundation for Development Alternatives*, No 52, 1986, 4-14.
12. W. E. Rostow, *The Stages of Economic Growth*, Cambridge University Press, 1979, 4.
13. Edward Goldsmith, 'The World Bank: Global Financing of Impoverishment and Famine', *The Ecologist*, Vol. 15, Nos. 1/2, 1985.
14. W. D. Chandler, *Worldwatch Paper 72*, Worldwatch Institute, Washington DC, 1986.
15. R. Bahro, *From Green to Red*, Verso, London, 1984, 211.

## The Stable Society Edward Goldsmith

Today there is much talk of a 'steady-state' or 'stable-society', but few have really considered how this would be achieved or what it entails in social, cultural and economic terms. In this important book, Edward Goldsmith looks at how stability is maintained in traditional human societies and considers the implications for modern society.



Now available at the special SALE price of £3.80 (hardback), £2.50 (paperback), from *The Ecologist*, Worthyvale Manor, Camelford, Cornwall, UK. Please include £1.00 (UK postage) or £2.00 (overseas) with your order.

## The Death of the Loire?

*A death sentence has been served on the Loire, the longest free-flowing river in Europe and one of its most beautiful.*

Despite vociferous protests from environmentalists, the French Secretary for the Environment, M. Brice Lalonde, recently approved the construction of a dam at Serre de la Fare in the Massif Central, the first of four dams on the Loire and its tributaries the Allier and the Cher. Further dams have been planned but have not yet been approved.

SOS Loire Vivante, a coalition of environmental groups supported by the World Wide Fund for Nature, began a sit-in at the dam site in February and are appealing for more people to come and give them their support. Local people as well as men, women and children from other parts of France, Switzerland and Germany are already camped in the gorge, and it is hoped that more will follow. A large demonstration was held on April 29th and 30th in Le Puy, with a march from the town to the dam site.

The agreement to go ahead with the dams is the product of intense lobbying by EPALA (Etablissement Public d'Aménagement de la Loire et de ses Affluents — the Public Committee for the Improvement of the Loire and its Tributaries), an undemocratic and monolithic organisation uniting six regions, 14 departments and 17 cities. EPALA, headed by M. Jean Royer, the Mayor of Tours, has been accused by its opponents of getting its plans accepted by a mixture of lying, intimidation and bribery. M. Royer intends that the first four dams, Serre de la Fare on the upper Loire, Le Veudre and Naussac 2 on the Allier and Chambonchard on the Cher, and tens of kilometres of dykes will be constructed by 1998. Thirteen more dams will complete the mega-project.

EPALA wants to create a series of huge reservoirs to irrigate the rich farmland of the lower Loire at a time when intensive farming is threatening the integrity of underground water reserves and Europe is awash with

surpluses. The stored water is also apparently necessary as a coolant for a proposed nuclear power scheme on the Allier, despite the fact that Electricité de France recently announced that it has a surplus in generating capacity (see *The Ecologist*, Vol. 18, No. 1) equivalent to seven nuclear plants. EPALA also claims that its scheme is necessary to control the occasionally severe floods on the lower Loire. However ecologists now recognize the importance of flooding in restoring soil fertility and replenishing underground water supplies, an importance which has been graphically illustrated by the disastrous consequences of the Aswan dam on soil fertility in Egypt.



*Part of the upper Loire to be flooded if the Serre de la Fare dam is built (Photo: M. Arnould).*

Another purpose of the dams is to promote tourism. The drowning of beautiful gorges, traditional villages, rare wildlife and archaeological sites in the name of tourism sounds like a bad joke. But EPALA are serious, and claim that their reservoirs will be new 'fjords', certain to draw thousands of sunbathers and water sports enthusiasts. EPALA have even stated that the dams will "protect and enrich the natural surroundings" of the region — an almost inconceivable claim when the gorges to be flooded harbour an esti-

mated 97 protected species of animals. An even more absurd justification for the dams is that the stored water will help to dilute pollution.

In fact the real motivation for the project is more the obsession of M. Royer to see the completion of what he calls his "oeuvre immense" and the massive sums of money which stand to be made by construction firms such as Bonygnes and Ciments Lafarge. Some political parties, such as the Centre des Démocrates Sociaux, will also make considerable amounts of money.

SOS Loire Vivante was formed in February 1988, and has succeeded in raising national and international awareness as to the economic and ecological folly of the project. Thirteen thousand people have signed a petition (enclosed with this issue) addressed to President Mitterand, and more than 1000 took part in a rally in the town of Le Puy in October. The occupation of the Serre de la Fare site began just nine days after M. Lalonde (a former head of Friends of the Earth France) gave permission for construction to begin. SOS Loire Vivante believe that with enough support, they can emulate the Austrian greens who halted construction of the Hainburg dam with similar tactics.

*Martin Arnould  
SOS Loire Vivante*

*For more information about the anti-dam protests contact: SOS Loire Vivante, 8 rue Crozatier, 43000 Le Puy, France. Tel. 71.05.57.88.*

- Please sign the petition enclosed with this issue and return it to SOS Loire Vivante at the address on the petition form.
- Write to the Prime Minister, Michel Rocard, Hôtel Matignon, 75 Paris, and tell him of your opposition to the dams.
- Financial contributions can be sent through national WWF groups.





## Books

### The Gospels of Global Efficiency

THE GAIA ATLAS OF PLANET MANAGEMENT, Gen. Ed. Norman Myers, Pan Books, London, 1985, £9.95, 272pp.  
STATE OF THE WORLD 1989: A Worldwatch Institute Report On Progress Towards A Sustainable Society, Norton, London, £6.95, 256pp.

WORLD RESOURCES: An Assessment of the Resource Base that Supports the Global Economy, World Resources Institute/International Institute for Environment and Development, Basic Books, New York, £10.95, 371pp.

OUR COMMON FUTURE, World Commission for Environment and Development (Brundtland Commission), Oxford University Press, £5.95, 383pp.

Its raining reports on the state of the planet. The *Gaia Atlas* and the Worldwatch Institute's *State of the World* are available in more than a dozen languages, the annual report of the World Resources Institute is in easy reach of enlightened UN officials, and environmentalists across the world hail the report of the Brundtland Commission as high-level support of their claims.

We should be grateful. The appeal for urgent responsible action is long overdue. Yet, my admiration for the reports is diminished by my concern about the long-term effects of the proposed policies of resource management. These policies reduce ecology to a higher form of efficiency and thus implicitly affirm the conventional economic worldview, and help to further the Westernization of minds and habits — a cultural imperialism that endangers the goal of sustainability.

### More Out Of Less

The reports paint a picture of the world with, on the one hand, an increasing population, with increasing needs for food, shelter, health care and energy, and on the other, economic systems which squander their potential to meet these demands as they deplete resources, and ruin the environment. We burn in one year a quantity of fossil fuels which took one million years to produce. We overconsume and pollute the water supplies necessary for the continued survival of humans and other species. Examples abound. Fortunately, according to the 'eco-developers', there is a glimmer of light in the distance. Renewable fuels, efficiency, conservation and careful management are the proposed solutions. I do not doubt the necessity of this approach, but I think it vital to emphasise the hidden reductionism which turns ecological politics from a call for a new worldview of respect for the planet into a set of managerial strategies. As with a pair of pliers, where pressure is relieved by lessening the grip of both handles, there are two escape routes from the dangerous squeeze between growing demand and insufficient resources — to restrain demand and to manage properly the resources which are used. The worldwatchers, however, highlight only the latter. In their reports, they spearhead the transition from an output-centred to an input-centred economy, where resources are not lavished on boosting the GNP, but are utilized with the utmost efficiency in order to obtain growth without waste. Optimizing, not maximizing, is the order of the day, and both engineers and economists can take renewed pleasure in their trade, puzzling out the minimum input for each unit of output.

Yet, disregard for the first alternative — to restrain supply-oriented demand — traps the worldwatchers into the economic worldview where society puts production highest on its list of values and seeks the 'good life' through expanding and accelerating the economic apparatus. The reports rarely question the predominant position of the economy in society, they take it for granted that the world's cultures converge in the steady desire for more material production. This prejudice bars the way to examining closer the politics of intelligent self-limitation, which attempt to adapt the volume and structure of production/consumption to society's overall goals. The reports therefore seem to consider less commodity-intense and less professionalized societies inherently

deficient. The eco-developers are unable to imagine cultures that do not seek to maximize material demand, and thus make the quest to increase material wealth appear as the natural mode of human living. Consequently, the solutions they propose continue (in the tradition of 'development') to assume that all circumstances have first to be judged according to the imperative of production.

### Resources Everywhere

The myopia of conventional economists has become proverbial. While staring at the role of capital and labour, they ignore many other sources of wealth and well-being, from the unpaid labour of women backing up the world of production, to the silent workings of nature replenishing water, nutrients and energy. The world-watchers wish to overcome this tunnel vision; they seek to mine the broad range of life-support systems to assure the long-term sustainability of yields. Under world-watcher eyes, numerous objects and actions which are normally taken for granted acquire a new significance: they change into valuable resources. Cow dung, kindled by the Senegalese peasant to heat water in the cooking pot, suddenly becomes an energy resource; the scrap metal used by a Peruvian squatter to build an annexe to his hut, takes on the dignity of a recoverable input; Kenyan women cultivating village fields are discovered to be human resources for boosting food production. In what new light do actions, things and people appear when they are re-defined as 'resources'? They count not because of what they *are* but because of what they can *become*. They are stripped of their worth in the present to be stored for use in the future. A resource is something that has no value until it has been made into something else. For more than 100 years the world has been surveyed for 'resources' to feed our industries. Consequently, we have been trained to look at forests and see timber, at rocks and see mineral wealth. The synonym for 'resources' reveals clearly their purpose. What is the use of 'raw materials' if they are not to be finished in a manufacturing process?

But it is not just productive use that can transform something into a resource. While the peasant in Gujarat may use cow dung to fertilize his plot, it becomes a resource only in the framework of national production. It is in national (or global) accounting books that resources are specified, measured and assessed according to

their relative productivity: it is the capacity to boost GNP that constitutes a resource.

In a non-economic perspective, things often have a meaning which makes them resistant to over-exploitation. In a Hindu village, there is always a holy tree or sacred grove which is untouchable. Gods are said to reside in their shadow — to cut them as timber would deprive the village of holy protection. From Bolivia to ancient Germany, mines were regarded as wombs of Mother Earth where metals grow in slow gestation. Entering this underground world meant crossing a threshold into a domain which does not rightfully belong to man. Responsibility and care were required, and rituals were performed in order to ask for the Mother's generosity. The North American Cree required the co-operation of nature when they went hunting deer. For them, animals had to be convinced, in a dialogue of rites and offerings, to present themselves to be hunted. Treating trees, rocks or animals as essential parts of a wider cosmos, where each element possesses its separate but related identity, entails intrinsic limits on exploitation. Labelling things as 'resources' strips them of whatever protective identity they may have and opens them for intervention from the outside.

## Cultural Fallout

The clock, we are warned, shows five minutes to twelve. Or even less. Be it Gaia, Worldwatch or even Brundtland, they set off the alarm and seek to alert us against the threat to the survival of the planet. The message is fully credible. But the conclusion is dangerous. Looking at water, soils, animals or people in terms of 'resources' turns them into objects for management by planners and for prizing by economists. Even if they are renamed 'resources' in order to maximize their efficient use, because of the cultural fall-out from the all-embracing economic cloud, it will, in future, be much more difficult to have any intrinsic respect for them.

*Wolfgang Sachs*

## Scotland's White Revolution

THE HIGHLAND CLEARANCES, by John Prebble, Penguin, London, 1969 (reprinted 1989), £4.99, 336pp.

The eviction of the crofters (peasant farmers) from the Highlands of Scotland in the 18th century to make way for the raising of sheep provides a clear example of the effects of development upon sustainable lifestyles.

The most common breeds of sheep before the clearances had difficulty in surviving the harsh highland winters, so when a new Cheviot sheep was bred which could survive the coldest winters, the mostly absentee lairds (landlords) were quick to see the economic possibilities. Hence began Scotland's 18th century green revolution, or perhaps more appropriately its white revolution.

The crofters knew exactly how to make the best use of their difficult environment but the economic returns on their activities were low, as was the rent they paid to their lairds. The lairds therefore claimed that the replacement of highly inefficient crofters with highly efficient sheep provided the most rational use for the Highlands. The crofters were redundant and had to be got rid of.

## White and Green Revolutions

The promoters of the clearances used arguments similar to those used today to introduce the green revolution in the Third World. Economic efficiency was the main justification. In the words of Sinclair "The Highlands of Scotland may sell, at present, perhaps from £200,000 to £300,000 worth of lean cattle per annum. The same ground will produce twice as much mutton, and...under the Cheviot...will produce at least £900,000 of fine wool."

A contemporary observer described the haste with which landowners grasped the new opportunities. "A ravenous spirit of avarice seems to have spread like an epidemic and seized on all those who were the owners of property in the Highlands. They hastened to be rich, and in the determination to succeed they cast away all claims of gratitude and justice...the strong bond which had for ages knit chieftains and clan became as withes...and a sheep was now to rank higher than a man."

According to Prebble, the Cheviot sheep "came up the old cattle roads into Argyll, Inverness and Ross. They climbed where the deer died, they thrived where black cattle starved. Land which had produced 2d. an acre under cattle now yielded 2s. under sheep. Four shepherds, their dogs and three thousand sheep now occupied land that once had supported five townships."

To accommodate the shepherds and their sheep, the crofters were systematically evicted. Dr. McCulloch, who travelled in the area, tells us that on Rhum only one farmer remained of the hundreds that had once lived off their black cattle and their seaweed. The island of Ulva according to Hugh Miller "was turned into a single sheep walk." "The Blue Isles of Tiree and Coll lost half of their people. St. Colombo's Iona, 'broad, fertile and fruitful of corn', became the necropolis of fifty Scottish kings and countless forgotten chiefs." Those evicted joined the throngs of the destitute. The lairds seemed quite unmoved by the fate of their clansmen. No alien colonial power could have treated its subject people with such callousness and cynicism as the lairds showed toward their own kith and kin.

The lairds tried to justify the clearances with similar arguments to those later used by the colonialists when trying to justify their policies in the Third World. They tried to exaggerate the crofter's poverty, their rough and austere life, their lack of roads and modern amenities and the crude huts of sod and stone in which they lived with their crude agricultural techniques.

James Loch, the hated manager of the Sutherland estates pointed out how "they (the crofters) added little to the wealth of the empire." Subsistence agriculturalists of course make no contribution to the formal economy. The English who travelled in the Highlands felt the same "impatient contempt" for the crofters that "their grandsons were later to feel toward African and Indian." They were accused of "congenital idleness" and were criticised for showing no interest in improving their standard of living. Loch declared that the crofters "deemed no new comfort worth the possessing which was to be acquired at the price of industry; no improvement worthy of adoption if it was to be obtained at the expense of sacrificing the customs or leaving the hovels of their ancestors."

The crofters' 'primitive' customs were also accentuated. Thus McCulloch tells us: "The attachment of the wretched creatures in question was a habit; the habit of indolence and inexperience, the attach-



ment of an animal little differing in feeling from his own horned animals...They were children, unable to judge for themselves, and knowing nothing beyond the narrow circle of their birth. As children, it was the duty of their superiors to judge for them, and to compel them for their own advantage."

Like colonial subjects in the centuries to come, the crofters were regarded as little more than children that did not know what was good for them. Efforts on the part of tenants to resist eviction were regarded by Loch as but "formidable obstacles to the improvement of a people arising out of the prejudices and feelings of the people themselves." Loch, just like present day developers, also sought to justify his action on moral grounds, pointing out how humans came into the world without natural protection against the weather and therefore it was his duty to provide wool to be made into clothes for them. "On this principle was a good conscience. I grow wool on mountains that are covered with peat bog thinking that I thereby benefit my fellow men."

Only a few criticised the clearances. One was the Swiss social scientist Sismondi de Sismondi: "There is something so absurd and revolting...in interpreting as a form of progress the destruction of the happiness, of the liberty, of the very existence of a race in the interests of wealth."

## The Law

The evictions, just like similar evictions being carried out today throughout the Third World in order to accommodate large scale development schemes, were made with the full backing of the law. Those who refused to leave were often forcibly evicted, and sometimes their houses were burnt down around them. Those who offered any resistance were taken to court.

Mr. Justice Clark-Hope, making judgement in Inverness on one of the victims, stated self-righteously "neither they nor their neighbours can be allowed to suppose that they can live in this kind of wicked and rebellious spirit against the Law. They must be taught submission in the very first instance."

At the trial of Ann and Peter Ross, who refused to be evicted, the same judge warned that "there exists a singular and perverted feeling of insubordination in some districts of the Highlands against the execution of civil processes in the removal of tenants. This feeling is most prejudi-

cial to the interest of all, and it is absolutely necessary to suppress it."

Sismondi, by contrast, had little regard for the law. "If the Marchioness of Stafford (wife of the Duke of Sutherland, one of the most callous landowners in the Highlands) was indeed entitled by law to replace the population of an entire province by twenty-nine families of foreigners and some hundreds of thousands of sheep, they should hurry up and abolish such an odious law, both in respect of her and of all the others in her position."

Sismondi also noted that in Switzerland a very different law prevailed. It gave the peasant a guarantee of ownership of his land in perpetuity, "while in the British Empire it has given the same guarantee to the Scottish laird and left the peasant insecurity." Sismondi believed that the law should keep land outside the orbit of the market economy, that the occupancy of land should be determined, not by narrow short-term economic factors, but by social and ecological ones.

## Famine

After the evictions were well under way, the Highlands suffered a particularly bad famine. If people are pushed off their land and condemned to a life of penury, it is not altogether surprising that they should starve. Under these conditions, a single bad harvest is all that is needed for famine to strike. The authorities' reaction to the famine was predictable: the market system could not be interfered with and direct food aid was thus discouraged. Instead, public money was advanced for drainage


purposes, but those employed in drainage schemes had difficulty in finding food to buy.

Exports of food continued unabated. In Rosshire, half of the annual wheat harvest was exported to London and the rest was sold as flour. Wheat would only be sold locally at a price that could be obtained in England. The merchants, "aware that the people might not appreciate the sound economics of this", asked the Sheriff to provide police and soldiers to protect the wagons transporting the wheat to the ships.

## Overpopulation

Just as in Africa today, impoverishment, malnutrition and famine were blamed on overpopulation. It never occurred to anyone that if people had not been evicted from their lands they would be neither poor — in the true sense of the term — nor hungry.

In 1841 the landlords demanded in Parliament "an extensive system of emigration to relieve the destitute poor of the Highlands", a measure which was finally adopted ten years later. The Board of Supervision that administered the Poor Laws had been trying to force people to emigrate for some time and they were "in a constant state of irritation over the people's reluctance to leave their homes." By putting the burden of poverty relief on the shoulders of the local authorities, life was made even more difficult for the Highlanders. Indeed, the administration of the Poor Laws was seen by Prebble as "designed to starve the Highlanders into sub-



The  
Kingcombe Centre

**CONSERVATION MANAGEMENT COURSES 1989**

<b>August 25-27</b>	THE CONSERVATION AND MANAGEMENT OF GRASSLAND <b>Derek Wells (NCC)</b>
<b>October 2-6</b>	PRACTICAL CONSERVATION AND THE PRINCIPLES OF MANAGEMENT Lectures, visits and practical tasks.

Lower Kingcombe is a tiny hamlet in an idyllic corner of West Dorset, surrounded by land that has remained free of pesticides, fertilisers and hedging flails, and is now largely a nature reserve.

*For details of these and other courses, contact Nigel and Jill Spring, The Kingcombe Centre, Toller Porcorum, Dorchester, Dorset DT20 0EQ. Tel: 0300 20684*

---

TO THE KINGCOMBE CENTRE  
Please send me details of the 1989 Programme as advertised in *The Ecologist*.  
Name:.....  
Address:.....  
Tel:.....

mission." These people after all were redundant. They simply interfered with the economic process and prevented the 'rational' use of land resources in the Highlands

## Transportation to the New World

The business of transporting people to the New World rapidly fell into the hands of speculators. The Highlanders suffered terribly. Legislation was passed to improve their lot but in the words of Prebble they "made little impression on the self-interest of contractors or the indifference of authority. Overcrowding continued and disease increased." When the little brig *James*, arrived in Halifax in 1826, everybody on board was ill with typhus; conditions on board were so terrible that the Governor-General of British North America told the Colonial Secretary that "there are not many instances of slave-traders from Africa to America exhibiting so disgusting a picture...The most favourable account that reached me admitted no sort of comparison between her and a French slaver brig captured by me four years ago when in command of a frigate on the Leeward Isles."

## No One To Go To War

Highland troops had until the clearances formed an important part of the British Army. In 1793 however, when the lairds tried to recruit their clansmen they found to their astonishment that no one would join up. According to the writer Don Ross: "In Sutherland not one single soldier can be raised...The men told the parson. 'We have no country to fight for. You robbed us of our country and gave it to the sheep. Therefore, since you have preferred sheep to men, let sheep defend you.'"

The destruction of Highland society was long lasting. When Australian mutton and wool put an end to the sheep economy of the Highlands, a new economic use was found for the land, one which also required keeping it empty of people. It was rented out for deer shooting. More recently, as Prebble notes "spruce and fir were regimentally planted over the ruins of the townships and the enduring green of the potato gardens. Men accepted the removals as inevitable, a casualty of progress." The lowlander "has inherited the hills, and the tartan is a shroud."

Edward Goldsmith

## BOOK DIGEST

*Books which are covered in the digest may be given full-length reviews in forthcoming issues.*

- *DEVELOPED TO DEATH: Rethinking Third World Development*, by Ted Trainer, Green Print, London, March 1989, £6.99, 230 pp.

A devastating critique of conventional political and economic attitudes to aid and development. Trainer shows that economic growth and 'market economics' are the prime cause of worldwide poverty, scarcity and injustice. The alternative proposed is a 'green' approach to development which would yield a just, peaceful and sustainable world.

- *THE GREEN GUIDE TO ENGLAND*, by John Button, Green Print, London, March 1989, £4.99, 189 pp.

A tourist guide for people who don't like tourists. Button declares that he hates visitor centres, crowds and the 'heritage industry' and then goes on to list where we can find them. Rather biased towards urban attractions for a 'green' guide, it is nevertheless a useful introduction for the visitor looking for something other than stately homes and amusement arcades.

- *STARK*, by Ben Elton, Sphere, London, 1989, £3.50, 453 pp.

A comedy thriller set against a backdrop of a world being poisoned, overheated, irradiated and overpopulated, it succeeds in alerting readers to the environmental crisis while being extremely funny. *Stark* will be read by a much wider audience than most 'green' books and hopefully some of those who read it will be encouraged to take more of an interest in the green movement.

- *POISONED ARROWS: An Investigative Journey Through Indonesia*, by George Monbiot, Michael Joseph, London, March 1989, £13.95 (hardback), 246 pp.

An account of a journey through West Papua (Irian Jaya) and of the horrifying human rights abuses which the Indonesian government is committing against the tribal people of what is effectively a Javan colony. At considerable personal danger, Monbiot has exposed the genocidal consequences of the World Bank-supported transmigration into this region.

- *STAYING ALIVE: Women, Ecology and Development*, by Vandana Shiva, Zed Books, London, March 1989, £8.95 (paperback) 224 pp. Available from Zed Books, 57 Caledonian Road, London N1 9BU.

Shiva analyses the imposition of Western male-dominated economic development (more correctly described as maldevelopment) upon Indian women. She argues that modern science, technology, politics and the market economy are inherently exploitative of both women and nature. The ecological path of sustainability, harmony and diversity, Shiva believes, is the way to survival and liberation for women, nature and men.

- *WINNING THE HUMAN RACE?, The Report of the Independent Commission on International Humanitarian Issues*, Zed Books, London, October 1988, £4.95 (paperback) 220 pp. Available from Zed Books as above.

This report by an international group of 'eminent persons', offers an humanitarian interpretation of the threats posed by the population explosion, nuclear war, new technologies and the environmental crisis. A call to deal with the symptoms rather than the causes of our problems, the report puts its faith in a United Nations-inspired "multilateralism".

- *THE REDESIGNED FOREST*, by Chris Maser, R. and E. Miles, San Pedro, California, November 1988, \$9.95 (paperback) \$18.95 (cloth), 234 pp.

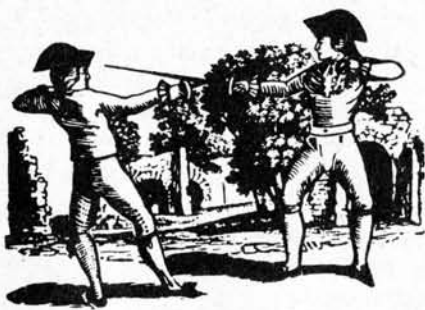
In this fascinating book Maser argues that we are redesigning Nature's forests into humanity's plantations and therefore redesigning the structural and functional processes of the world, such as cycles in soil fertility, water and climate. He claims that we now have the technology to disarticulate the entire global ecosystem and that to survive we must define a new paradigm not only for forestry, but for natural resources in general.

- *DICTIONARY OF ECOLOGY AND THE ENVIRONMENT*, Peter Collin Publishing, Teddington, Middlesex, 1988, 212 pp.

A dictionary of 5,000 words and expressions with examples of words used in context. It should be useful for school students and those new to ecology. The entries chosen are sometimes surprising, for example 'trivial' and 'sunrise', and the definitions sometimes curious, for example, 'graveyard' is defined as "place where nuclear waste is buried".

Patrick McCully





## Letters

### Gaia: A Thesis too Far?

Dear Sir,  
While I have long admired Edward Goldsmith's well-founded rejection of scientific reductionism, I think he has gone over to the other extreme in embracing the Gaia hypothesis in his essay 'The Way: An Ecological Worldview' (*The Ecologist*, Vol. 18, Nos. 4/5). His 'Principle 22' ('Gaian processes are teleological') is, in my view, unsustainable; also, I think he is not providing a full, fair picture of Darwinian and evolutionary thought, or of how evolution proceeds, which is by no means a random process as he seems to believe.

First, the Gaia hypothesis is unnecessary. An accurate understanding of evolution (which proceeds not only by random genetic mutations but by constant interaction with the external environment) as well as sexual selection demonstrates that as of this moment, evolution and natural selection are fully capable of explaining how extant organisms and biological/chemical processes and physical conditions came into being and why they persist. These are the conditions for sustaining life on earth (and keep in mind that the early biospheric conditions were quite different from today, and that today's conditions were not pre-ordained either); however, pre-existing conditions, in particular the "first" state, necessarily give rise to those types of life that are compatible; in turn, these forms of life affect their environment as well as adapting to it, and create a new emergent condition, and so forth at each new level of complexity. By definition, life exists in harmony with its environment. Nothing says, however, that the "first State" had to come into existence, but because it did, it thus placed restrictions on both the extant life forms and the next state.

Of course programming is not random, as Principle 22 says. Then who did it? The external environment via natural selection, to be sure, not as part of Gaia's purposeful strategy to achieve stability but because the fit between genes and environment (adaptation) tends to remain stable unless

external conditions change either through the action of living things or by catastrophic geophysical events (such as climatic, volcanic eruption, etc.). Evolution and natural selection are inherently conservative and "stable"; rather than encourage new, untested gene combinations, nature tends to retain adaptive genomes, thus minimizing randomness, which is risky and unstable.

To treat Gaia as a single organism that adapts (or forces adaption) is either to regard her as a creation of a deity or to treat her as an individual like other organisms, and therefore subject to the same laws of evolution and natural selection. But the notion that a system (for Lovelock himself states that Gaia *contains* many components), which is comprised of other systems and organisms evolves and adapts is unsupportable.

My personal view is that not only is the Gaia hypothesis unnecessary but it leads to an oversimplification and offers itself as an easy way to answer or resolve uncertainties, complex ideas and systems. In this way, it could go to the opposite extreme of reductionism and smooth over the very significant differences and complexities of species, biotic communities and biological systems. Recognizing these individualities does not bind us to analyse them *only* in isolation or in particulate form, or to quantify them as resources or regard them apart from their communities or larger systems. I think we have here a basic difference between the thinking of physicists, who deal in "fixed" laws (even when they are probabilistic), and that of biologists, who must deal with diversity and change. May I respectfully suggest that Edward Goldsmith re-examines, in all fairness, evolution and natural selection which, properly understood have already provided the "explanations" which Gaia's proponents claim to have arrived at only recently.

Yours faithfully,  
**Lorna Salzman,**  
Brooklyn Heights,  
USA.

### Changing Ourselves Not Governments

Dear Sir,  
I agree with nearly everything that Sandy Irvine said in his very perceptive review of Herbert Girardet's and my book, *Blueprint for a Green Planet* (*The Ecologist*, Vol. 19, No. 1). But I would submit that the intended readership of a book must have a bearing on its contents. Certainly, as Mr Irvine points out, overpopulation is a major factor causing planetary degradation. But this has now become primarily a Third World

problem and this book will just not be read by the people of the Third World. It was written for the people of the 'Developed' World and they have more or less stabilized their population.

Also, it was not written for, nor will it be read by, governments. Admittedly governments *could* do all sorts of nice things but they are not going to, because they are only in power for five years and then must present themselves for re-election. There are no votes in 'the future' and precious few, I believe, in the lakes or forests of Scandinavia. Maybe Mrs Thatcher has twigged that there might be some votes in the ozone layer, but she is not going to allow any legislation that will inconvenience the City, or big industry, to save the ozone layer or anything else.

Therefore our book addresses only those people who will conceivably read it, and that means literate people of the so-called Developed World. And it is our contention that such people *can* do things, and abstain from doing others, to help to save our planet.

No doubt, as Irvine says "continued population and economic growth will quickly cancel out any measures the book advocates to reduce pollution." Yes but that does not mean to say that we should not take those measures. Whatever happens to growth the world will be better if we take those measures — worse if we do not. And who knows — maybe overpopulation will take care of itself one day whatever we do or do not do about it. Nature has a way of arranging things. Maybe economic growth has too.

Also, it is quite true to say, as Irvine does, that: "the deciduous woodlands that once occupied British farmland" contained more stability and diversity than farmed country, even organically farmed. Yes, but the native deciduous woodland has gone. We have had the Neolithic revolution whether we like it or not. We are a farming species now and we are not suddenly going to go back to a hunter/gatherer society, and so it is no good advocating it. Surely what we must do is to conduct our farming — and our farm-based lives (for we all live them) in the way that is most benign and least damaging to our planet.

You and I cannot influence governments, nor big business, but we can conduct our own lives in a way calculated to save what we can of the biosphere. This may not seem much but it is as much as we can do.

Yours faithfully,  
**John Seymour,**  
Killowen,  
New Ross,  
Co. Wexford,  
Eire.

## Pollution And the Seal Epidemic

Dear Sir,

Your are quite right to have drawn attention sharply to the very real and proven dangers of PCBs to marine mammals and other forms of life ('Extinction: the PCB Threat To Marine Mammals', Vol. 18, No. 6). Unfortunately, this excellent article was marred by the picture of a common seal stranded during the recent North Sea epidemic, with a legend implying that the epidemic was caused, or in some way felicitated, by the seals' immune systems having been weakened by pollution — in the context of the article, by PCBs.

There is no evidence that this was so. Circumstantial evidence suggests otherwise; there have in the past been similar epidemics of seals and dolphins, with high mortality rates, in places and at times when PCBs were virtually absent. In the recent case the highest mortality rates were in areas of little contamination.

Furthermore, since very high mortality rates are normal in such epidemics (often 90 per cent or more) it would be exceedingly difficult, if not impossible, to demonstrate an additional effect of pollution, except perhaps by large scale experiments on captive animals; 'challenging' them, as experimental toxicologists quaintly put it.

The recent seal epidemic was, from the beginning, used by some environmental groups as a bandwagon to promote governmental actions to reduce pollution. The objective was good, but the argument used was erroneous and probably counter-productive. Thus, as it daily becomes clearer that there never was any evidence that pollution was important in the phenomenon, people who became deeply concerned about pollution because of the seals will perhaps conclude that they have been hoodwinked. Such reactions are not good for the cause of fighting pollution, nor for that of saving marine mammals from possible extinction, or, at least, from a great deal of pain.

Yours faithfully,

**Sidney J. Holt,**  
Citta della Pieve,  
Italy.

## Nuclear Power A Help?

Dear Sir,

Nuclear power is, of course, not the whole answer, but it is quite a help. Mr John Sears (Vol. 19, No. 1) makes a number of errors in his reply to my letter (Vol. 18 Nos. 2/3). I did myself mention that exhaust emissions must be responsible for part of the 40 per cent excess of cancers in Glasgow. Does

John Sears not recognise petrol and diesel oil as fossil fuels?

Plants are using up some of the excess  $\text{CO}_2$  in our atmosphere, though in the cooler parts of the world, temperature, rather than  $\text{CO}_2$ , is the chief limit to growth. But the increase of  $\text{CO}_2$  that we observe, about which both of us are concerned, represents the output of fossil fuel burning after subtracting all that is taken up by land plants plus plankton plus simple dissolution in the ocean. And I want to preserve the forests for their own sake, not only as cleaners up of unnecessary wastes. I agree that the CFCs may be more important than  $\text{CO}_2$ , molecule for molecule, but there are not nearly so many molecules and their production does not depend on which power sources we use.

Military grade plutonium can certainly be produced — at a greater cost — by civil power reactors, but shutting down all of the power plants would not prevent the production of bombs; every one of the bomb countries had produced bombs before they were able to build power plants.

A nuclear explosion in a fast breeder reactor is not possible because an excessive temperature rise increases the efficiency of absorption of neutrons by the non-fissile uranium-238 in the fuel, reducing their availability to the fissile plutonium.

John Sears should visit a good library and look up a table of isotopes. Nitrogen-15 is not unstable; it forms a little less than 0.4 per cent of all the nitrogen on the planet and has done so since the world began. An energetic neutron liberated by cosmic ray interactions can knock one of the seven protons out of a nitrogen-14 nucleus, being itself captured to form carbon-14. The long half-life of this smooths out the effect of variations in cosmic ray intensity, and maintains an average concentration in the atmosphere of about one atom in about a million million atoms of stable carbon-12, which ratio is of course maintained in living plants and animals. The atmospheric bomb tests produced enough neutrons to nearly double the previous average concentration, but time and vegetation and carbon dioxide free of carbon-14 from fossil fuel burning are steadily reducing it. The contribution due to leakage from nuclear reactors has always been infinitesimal compared with the natural random variation in cosmic ray produced material, with which all life on the planet has successfully coped for at least 2000 million years.

It may seem that I am being pernickity about details, but it is very desirable that the technologists in both nuclear and fossil fuel power production should listen to ecologists, and they will not do so if they meet a lot of elementary mistakes, any more than a first-class book on the use of English would be taken seriously if it had spelling mistakes on every page, however little this affected the message. Myself, I

very nearly missed John Sear's final statement on the urgent priority of limiting population growth, with which I entirely agree and which is far more important than anything else in either of our letters.

Yours faithfully,

**John H. Fremlin,**  
Emeritus Professor,  
46 Vernon Road,  
Edgbaston,  
Birmingham,  
England.

## Climatic Flip

Dear Sir,

In his report on the protests against the Xingu hydroelectric project in Amazonia (*The Ecologist*, Vol. 19, No. 2), Nicholas Hildyard makes reference to the possibility of a climatic "flip" in which the Earth's climate is violently altered to a new state which may not be hospitable to human life.

Research into the mathematics of meteorology since the early 1960s has shown that the possibility of climatic flips does indeed lurk within the equations governing the atmosphere. It stems from the so-called non-linearity of the fundamental (Navier-Stokes) equation which describes the behaviour of a fluid (such as our atmosphere) which is subject to differential heating and rotation. This property means, in simple terms, that small changes in heating caused by, for example, pollution, do not necessarily lead only to small changes in the behaviour of the fluid, i.e. the climate.

In particular, if the differential heating between the poles and the equator exceeds a certain level, the behaviour of the entire fluid can become radically different. In the mathematical jargon, the system has changed from one stable "attractor" to another. It is, furthermore, possible that this new attractor is not simple and well-behaved, but is "chaotic", with violent, unpredictable swings in conditions becoming the rule rather than the exception.

Two questions, in particular, need urgent attention. Firstly, how much more heating can the atmosphere endure before the attractor, and hence the climate, changes.

Secondly, what is the typical timescale of such a flip? Can the thermal inertia of the oceans be relied on to rule out dramatic changes, on the scale of a few years?

Until such questions are answered, we can have no confidence in long-term predictions of conditions on our planet.

Yours faithfully,

**Robert Mathews,**  
Highbury Park,  
London, N5,  
England.



# Classified

## MISCELLANEOUS

**BENIGN SPERM WHALE RESEARCH** in the Azores. Volunteer Field Assistants required for July and August. Cost £1295. Please write enclosing SAE to: V. Papastavrou, 17 Hartington Park, Bristol BS6 7ES. UK.

**THE INTERNATIONAL MONETARY SYSTEM** must be reformed so that it enables and supports responsible planetary environmental management—contrary to what happens now. Any person/institution working or researching this subject is asked to contact: Vanya Walker-Leigh, PO Box 110, Gibraltar.

**JOHN SEYMOUR** will tour Britain in November giving talks on Blueprint for Green Planet etc. Groups interested contact J Seymour, Killowen, New Ross, Co Wexford, Eire.

Buy a piece of British countryside and save **THE LIZARD WILDFLOWER MEADOW** from compulsory purchase for a proposed road scheme. Several thousand owners required for successful campaign. £8.50 incl. per square metre plot. Details from Norfolk Friends of the Earth, Development and Environment Centre, 38-40 Exchange Street, Norwich, Norfolk NR2 3RZ. Tel 0603 625394 or 624945.

**ORGANIC GARDENING PROJECT** on derelict land in Inner City Birmingham seeks long-term and short-term help from keen volunteers. Opportunity to join radical Christian Community with extensive involvement in self-help projects in multi-racial neighbourhood. Contact: Volunteer Organiser, Ashram Acres, 23/25 Grantham Road, Sparkbrook, Birmingham B11 1LU. Tel: 021 773 7061.

**THE ENVIRONMENTAL FUTURES ASSESSMENT CONGRESS**, Worthing, 22-23 June. Details, Programme: South Coast Seminars, P.O. Box 101, St. Leonards-on-Sea, East Sussex, TN38 0XN. Tel: 0424 431797.

### ALTERNATIVE ENERGY.

Complete Design and Consultation Service. Full details on request from Robert J. Etheridge, Designs for the Environment, Worcester Walk Cottage, Clays Road, Nine Wells, Berry Hill, Nr. Coleford, Glos. GL16 7AT.

## DIARY DATES

**GANDHI SUMMER SCHOOL**, 24-30 July 1989, The Abbey, Sutton Courtenay, Oxon OX14 4AF (0235 847401). Talks, Music, Crafts, Dance, Relaxation . . . Topics: Lifestyle: Satish Kumar, Economics: James Robertson, Spirituality: Rex Ambler. Costs: Camping: £60, dormitory £70. Details from above address.

**SUMMER SCHOOL AT KEELE** to study **WILDFLOWERS** from 12-19 August cost £187 residential and £136 non-residential. Details from: Course Administrator, Dept of Adult and Continuing Education, University of Keele, Staffordshire ST5 5BG.

'Girls and women are heavily under-represented in all areas of information technology'. In recognition of this the Centre for Continuing Vocational Education at The University of Sheffield is organising a one day course on **GIRLS AND WOMEN IN COMPUTING**, 14 June 1989 fee £35.00. This will cover a variety of issues including problems at school level, womens' under-achievement in computing, careers counselling, career development and the problems relating to the career break. For further details please contact: Mrs Kathleen Wainwright, Centre for Continuing Vocational Education, 65 Wilkinson Street, Sheffield S10 2GJ. Telephone (0742) 768653.

International Conference: **IONISING RADIATION AND CANCER EPIDEMIOLOGY**. University of Birmingham, UK from 12-13 July 1989. Details from: Dr Tom Sorahan, Department of Social Medicine, University of Birmingham, Edgbaston, Birmingham B15 2TJ, UK.

**WATER POLLUTION AND WATER POLLUTION CONTROL** continue to be major issues in the UK. Privatisation of the Water Authorities is expected to lead to significant changes in many areas of pollution control. In recognition of the ongoing need for staff training in this field, the Centre of Continuing Vocational Education at The University of Sheffield is organising two short courses on Industrial Waste Water Treatment for the early summer. An introductory course is to be held from 6-8 June 1989 and is suitable for staff with limited previous background, while the advanced course from 27-29 June is designed as a follow-on course, or as a stand-alone course for more experienced staff. The courses will

cover legal, technical and financial management issues and are suitable for engineering, management and scientific staff. For further details please contact: Mrs K Wainwright, Centre for Continuing Vocational Education, 65 Wilkinson Street, Sheffield S10 2GJ. Telephone (0742) 768653.

**THE SUMMER UNIVERSITY**, Loughborough holds the following courses: The English Country House in the Eighteenth Century, 30 July to 5 August, Tutor: Mike Hope. Wildlife of Leicestershire, 6 to 12 August, Tutor: Mary Cornwell. Full residential accommodation available, including facilities for children of all ages. More information from Margaret Gill on 0509 222153 or 222162.

**MASS MEDIA IN A TIME OF CRISIS**. International Conference on media and our common future held 15-17 September 1989 at Västerås, Sweden. Further details from Institute for Social Policy, Hasseluddsvägen 194, S-132 37 Saltsjö-Boo, Sweden.

## HOLIDAYS AND COURSES

**DESERT-RECLAMATION RESEARCH CENTRE**: Charity offers unique working holidays in Spanish mountain village. Cost £40 (students etc. £32), work 24hrs weekly. Sun, purpose, good food, good company. Full details £1 from Sunseed Desert Technology, PO Box 2000T, Cambridge CB5 8HG.

**WORKING HOLIDAYS IN DEVON**. Weekly requirement of 18 hours of mixed work + £35 in return for full board and own room with a happy alternative community in splendid surroundings with swimming pool. Enquiries and bookings: Morchard Bishop 228.

## PUBLICATIONS

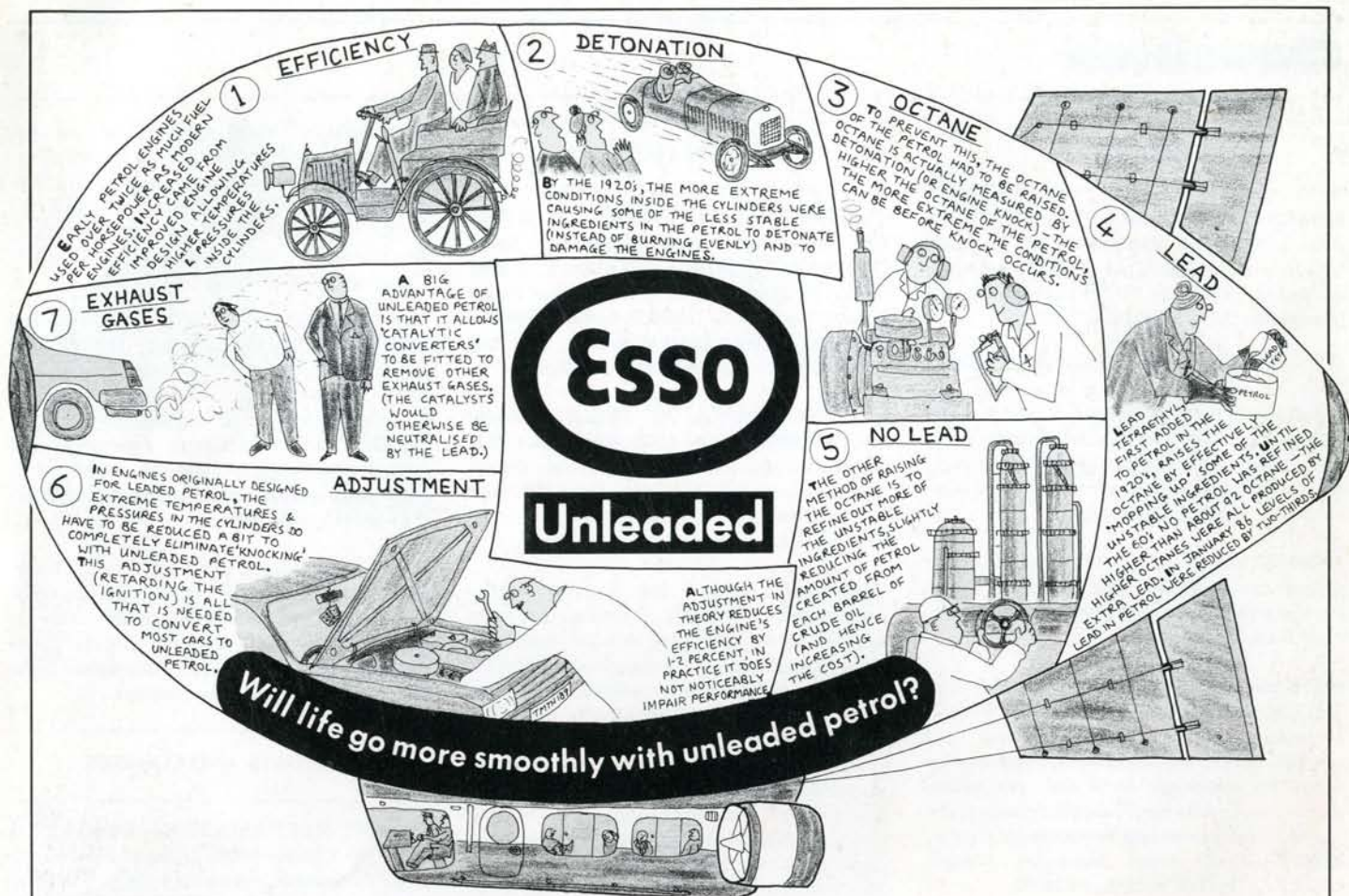
**WILDLIFE GARDENING MONTHLY**. New monthly magazine starting Spring 1989, covering all aspects of wildlife gardening. For subscription details SAE please to Wildlife Gardening Monthly, 55 Wyndham Road, London W13 9TE.

## PROPERTY FOR SALE

**ANDALUCIA, SPAIN**. Cottages, country houses, smallholdings, farms in unspoilt rural area of Costa del Sol. Prices from £10,000. Tel: 0223 211201.

Classified Advertisements in *The Ecologist* are 25p per word, minimum charge £5.00 (Box No £1.00 extra). Display £3.00 per sccm, minimum 3 sccm. Please add 15% VAT to your payment and send together with your text and cheque (made payable to *The Ecologist*) to: The Classified Advertisement Department, Worthyvale Manor, Camelford, Cornwall, PL32 9TT, UK.





We live on a vulnerable planet. We must learn how to care for it.

Over the past few weeks, many people in Britain will have seen the Esso Unleaded Airship taking to the air, to draw the motorist's attention to the environmental benefits of unleaded petrol.

Three years ago, Esso was the first oil company in Britain to provide unleaded petrol at service stations.



Today, it is increasingly available at Esso sites throughout the country.

We are planning ahead to develop the quality fuels of the future which will contribute still further towards improved environmental performance.

We intend to play our full part in improving the quality of the environment, whilst supplying the energy needs of future generations.

**Esso** Caring for tomorrow's quality of life.

