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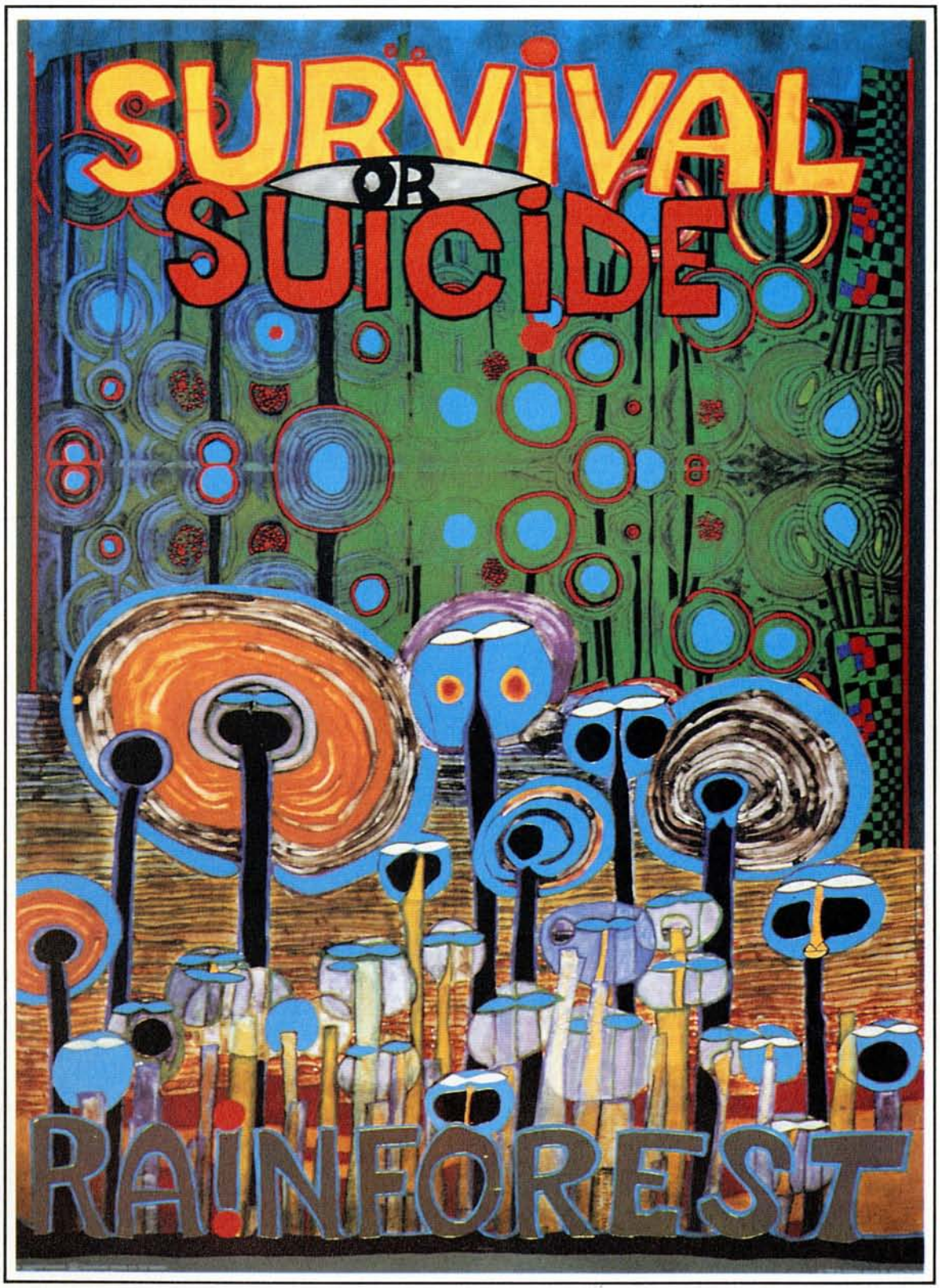

- The End of Industrialism
- Why Free Trade Destroys
- The Limits to Development in Europe
- The ITTO and Rainforest Destruction

The Political Economy of Logging:

Corruption in the Timber Industry

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Ecologist

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Editorial

Feature Articles

Many governments and environmental organizations see the International Tropical Timber Organization (ITTO) as playing a major role in solving the tropical forest crisis. But the ITTO is proving itself hopelessly compromised. Locked into a mindset that sees forests as having value only for their timber, and dominated by timber producers, it has become little more than a lobbying group for the timber trade.

A recent judicial inquiry into the timber trade in Papua New Guinea has revealed corruption to be rife within the industry. The huge profits being made make a nonsense of the claim that poor financial returns are to blame for poor logging practices. Within such a political climate, 'sustainable logging' is impossible.

Limburg lies at the heart of the 'Euregio', the border area where Holland, Belgium and West Germany meet. One of the most polluted spots in Western Europe, the region is on the brink of ecological collapse. Its devastation provides a salutory lesson to those who equate industrial expansion with progress.

Free trade is widely accepted as the foundation of a healthy economy. But many of its underlying economic assumptions are flawed: price is not a reliable guide to cost; comparative advantage is often questionable; and increasingly economies of scale do not hold true. The cost of slavishly pursuing free trade is the erosion of local self-reliance.

Feature Book Review

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Cover: 'Save the Forests: Save the Planet' by Friedrich Hundertwasser. Now available as a poster. See Inside front Cover for details.

The End of Industrialism

This has been the year of the 'End'. The 'End of the Cold War', The 'End of Nature' and even, according to a much publicized article in a Washington journal, the 'End of History'. One more 'End' is now also in sight. The End of Industrialism.

On 25 May, Working Group 1 of the UN Intergovernmental Panel on Climate Change (IPCC) released the executive summary of its scientific assessment of climate change. One hundred and seventy scientists from 25 countries contributed to the report, which declared unequivocally:

> "Emissions resulting from human activities *are* substantially increasing the atmospheric concentrations of the greenhouse gases . . . These increases *will* enhance the greenhouse effect, resulting in an additional warming of the Earth's surface".

Just to stabilize the concentrations of the long-lived greenhouse gases (chiefly carbon dioxide, nitrous oxide and CFCs) would require "*immediate* reductions in emissions from human activities of over 60 per cent". Prime Minister Margaret Thatcher, speaking at the release of the summary, endorsed the Working Group's findings:

> "The problems don't lie in the future, they *are* here and now, and it *is* our children and grandchildren who *will* be affected. The changes we are talking about *will* occur at a faster rate than anything our natural world has known in the past . . . Man's activities are already adding greenhouse gases to the air at an unprecedented rate, with *inevitable* consequences for our future climate."

In response to the Working Group's findings, Thatcher announced that Britain would cut its projected emissions of carbon dioxide by 30 per cent over the next 15 years — an ingenious piece of doublespeak. For despite the rhetoric, her "very demanding target" allows for increasing emissions throughout the rest of her probable political life, before bringing them back to their present high levels by 2005. The target is based on what appears to be a deliberately exaggerated Department of Energy forecast of a 30 per cent rise in UK CO_2 levels over the next 15 years. Between 1960 and 1985, Britain's emissions actually fell by 18 per cent due to the closure of heavy industry and greater energy efficiency, a trend which the Department of Energy's forecasters assume will somehow be dramatically reversed.

Mankind's Exalted Mission

Thatcher's feeble response to the climate crisis is echoed by other political leaders and by industry. The US has behaved even more irresponsibly, consistently blocking attempts to agree CO_2 emission targets at international fora, citing the need for more research and warning of the huge cost of emission reductions to the US economy. The February 1990 *Economic Report to the President* argued that the dollar costs of significantly slowing CO_2 emissions would be greater than the costs of adapting to the likely climate change. Although President Bush recently sang pæans of praise for science as "mankind's most exalted mission", he refuses to believe the missionaries: in a worldwide poll only nine per cent of scientists took the Bush line and saw no need for prompt action to reduce greenhouse gases. In Japan, the Council of Ministers, in a deceptively titled *Action Program to Arrest Global Warming*, declared that "a concrete target should be established after a full examination in order to achieve the stabilization of greenhouse gas emissions at their lowest level by the year 2000". It may be assumed that this 'lowest level' will not put too onerous a strain on the Japanese economy: Japan's powerful Ministry of International Trade and Industry (MITI) recently proposed a long-term project called 'New Earth 21' which aims to do no more than hold emissions at present levels *over the next 100 years*.

Not surprisingly, industrialists are following a similar line. Ian Graham-Bryce, Shell's head of environmental affairs, tells us that we must "maintain a sense of proportion about the greenhouse effect", which apparently means "taking advantage of all major energy resources to meet the energy needs of an expanding world population". British Coal also rejects any serious measures to restrict fossil fuel use, favouring instead: research into extracting CO_2 from power station chimneys; fertilizing plankton to enhance the uptake of CO_2 by the oceans; and "planting India or the equivalent with forest and then making sure that when the trees reach maturity they are turned into furniture not firewood". Such measures, claim British Coal, are "not totally impractical".

Lobbying Against Action

Industry is actively involved in lobbying against any measures which will affect its operations. According to Graham-Bryce, the IPCC is 'shadowed' by the International Petroleum Industry Environmental Conservation Association (IPIECA) and "direct contacts have been established with many of [the IPCC's] members". During the June meeting in London to update the Montreal Protocol on substances which deplete the ozone layer, the manufacturers of the alternatives to CFCs, which are all potent greenhouse gases, ensured that the 'global warming potential' of these substances was not taken into account in the negotiations. It is notable that the only two voices reported in the British press which wholeheartedly supported Thatcher's 30 per cent 'reduction' were the director of the Society of Motor Manufacturers and Traders, and a spokesperson for the electricity utility PowerGen, who claimed that the Prime Minister's speech had "set a positive challenge to our industry".

Environmentalists have, of course, severely criticized those who are dragging their heels over emission reductions. In Britain many unfavourably compared Thatcher's plan to stabilize emissions with the West German government's stated aim of *cutting* emissions by *a quarter* by 2005. Friends of the Earth cited their own research showing that, aside from the transport sector, the adoption of wide-ranging energy efficiency measures, renewables and combined heat and power schemes could produce a 46.5 per cent cut in CO_2 emissions by 2005, even allowing for the increasing energy demand resulting from an annual economic growth rate of 2.5 per cent. Numerous similar studies have been compiled around the world. One commissioned by the US EPA has calculated that, with a radical shift in policies and slow growth, world emissions could be reduced by 47 per cent by 2100.

Warming Limit

If these plans were adopted, they would go a long way towards slowing global warming. But, unfortunately, the IPCC estimate that we need a reduction of over 60 per cent *immediately* just to

stabilize the already high concentrations of greenhouse gases in the atmosphere. Even a reduction of this magnitude would not stop anthropogenic climate change. Far from it. There is a considerable time lag between when gases are emitted and when we feel the full effect on the atmosphere. Even the present concentration of greenhouse gases could lead to a disastrous increase in temperatures if possible feedback mechanisms come into play (for example, if the oceans' present ability to absorb CO_2 from the atmosphere is greatly impaired by rising temperatures).

In a study sponsored by the Dutch Ministry of the Environment, Wilfred Bach and Florentin Krause have attempted to estimate how much more CO_2 can be emitted before the globe faces the prospect of ecological collapse. They assumed that the world as we know it could withstand *at maximum* a warming of 1.5-2°C from present levels over the next few hundred years. They chose this limit as most of the Earth's current gene pool, including *Homo sapiens*, evolved over the last two million years, during which time temperatures have never been more than 2°C warmer than at present. According to Bach and Krause, the sea-level rise due to this temperature increase is not likely to exceed one metre, which would be 'manageable'; and trees may just be able to 'migrate' fast enough to keep up with this rate of temperature change. The expected warming from a doubling of carbon dioxide is 1.5-4.5°C, the wide difference between these figures being due to uncertainty over the 'sensitivity' of the climate to increased greenhouse gases, especially over how strong the various possible positive feedbacks may be. If climate is as sensitive as the upper figure suggests (and the upper figure is just as likely as the lower one), then we are already committed to a warming of over 2°C from the present *just from the greenhouse gases we have already emitted*.

So the outlook is grim. Even the IPCC's 60 per cent cut could result in ecological catastrophe. And this 60 per cent cut is a global average. Given the relatively low amount of energy used in most Third World countries, the industrialized economies will have to cut their high emissions by much more than the average. Just to keep within their 'warming limit', Florentin and Krause estimate that (taking a figure towards the top of the range for climate sensitivity) industrialized countries' CO_2 emissions would have to be reduced by *75 per cent* by 2030.

'Climatic Engineering'

It cannot now be seriously doubted that our climate is changing. The satellite data clearly shows this as do the string of abnormal weather events of the last few years; the fierce storms in Britain in 1987 and 1990, the 1988 drought in the US, the increasingly frequent devastating hurricanes in the Caribbean, changes in monsoon times and intensities throughout the tropics, and the unusually warm and dry last two years throughout Europe. It is also now an established fact that certain gases affect the Earth's heat balance and that the concentration of these gases is increasing. It is also uncontested that the chief culprit for the increase in these gases is human industrial activities. The only coherent intellectual position therefore for those, like politicians, industrialists and economists, who vigorously promote industrialism is to promote high-tech 'solutions' and to argue that climate change does not matter.

William D. Nordhaus, holder of a chair of economics at Yale, calculates that a 60 per cent cut in worldwide emissions "if efficiently engineered and phased in slowly", would cost over $300 billion annually. Nordhaus, whose views are similar to those espoused by many in industry and government, believes that "climate has little impact upon advanced industrial societies" and that greenhouse warming would have little effect upon America's national output. However, he realizes that there could be harmful effects upon other countries and that there is the possibility of surprises so he advocates 'climatic engineering' — shooting particles into space to cool the earth, altering land use patterns to change the globe's reflectivity and farming carbon-eating organisms in the oceans.

Constant Change

Contrary to what Nordhaus asserts, climate change will have a dramatic impact. It will effect just about every higher form of life on the planet. Nordhaus believes that shopping malls and air conditioners insulate North Americans from the climate, but can they insulate them from drought and food shortages? Water is now so scarce in Southern California that there are plans to ship it down from British Columbia. Supertankers are already having to carry water to some coastal areas in Greece, which is currently suffering its worse drought for 100 years.

Calculations of the effect of global warming on Britain and America apparently show that although farmers would have to change their crop mix, agriculture would be able to adapt to rising temperatures with only slightly reduced yields. However, predictions such as these assume that temperatures will change — and then stay constant. But of course this is not the case. If drastic emission reductions are not made, temperatures are likely to go on rising until the planet becomes uninhabitable. Climatologists give their estimates for global warming in terms of the temperature increase caused by a doubling of carbon dioxide — the much quoted figure of 1.5-4.5°C. But temperatures will not reach these levels and then stop. *They will go on rising*, and the accompanying changes in precipitation will also continue.

Farmers are going to be faced with the situation where the weather of the last few years will not be a guide to the weather of the next. How then will they know the best crop to plant? what its irrigation needs may be? and when it should be planted and harvested? Those who put their faith in more scientific research fail to understand the limits of forecasting the behaviour of a system as complicated as the atmosphere. Climatologists can predict that our climate will change, but we cannot expect them to give us accurate yearly models of how much the change will be and what it will mean in terms of rainfall, windspeed and sunshine.

The effect upon annuals may be serious enough. But what about perennials such as tree crops or vines? What is the point of a Sicilian farmer planting an olive tree now if by the time it matures it will be growing in a climate where only the date palm will bear fruit? In July 1990, it was reported that rainfall in Italy has dropped 40 per cent, destroying half of Italy's olive crop. Similarly, should a forester in the south of England plant a native oak, if a Mediterranean holm oak is likely to be better suited to the climate when the tree is only 30 years old — only a fraction of the normal lifespan of the tree? This is not a hypothetical problem for our great-grandchildren but an important question for anyone who wants to go out and plant a tree in their garden today. Interestingly, a recent World Bank discussion paper suggests that very large or long-lived projects should now be scaled down and/or delayed "in favour of buying time with smaller, shorter-lived ones, to observe what actually happens climatically within particular countries and regions".

Economic Contraction

The reality is that emissions must be cut and they must be cut drastically. But when we look at the emission reduction scenarios that even environmentalists are advocating we see that they are totally inadequate. In the UK, the Green Party, Friends of the Earth and others declare the need for minimum energy efficiency standards for appliances, for grants for insulating houses and for using low energy light bulbs. These measures are of course a beginning, but in terms of the immediate crisis we face they are just spitting in the wind.

It is time to come clean. Industrial expansion and a stable

climate are incompatible. Energy analysts' scenarios for the possibilities of emission reductions all assume continued economic growth — while only economic contraction can insure us against climatic catastrophe. The question is: have we the political will to make the necessary social and economic changes? In the conclusion to a report for the Dutch Ministry of Environment and Energy Research Foundation, W. Van Gool provides a chilling prediction of the likely outcome of an emission reduction plan under current economic and political conditions.

> "Probably the most devastating aspect of the . . . plan will be the result when it is ready: nothing will show for it. Surely, there will be less carbon dioxide in the atmosphere than without the plan, but it is impossible to see somewhat less of something that is invisible. No official person can put a flag on the result of the plan. No politician can show the result to the voters.
>
> "The conclusion is that the plan will not be executed. It is better to prepare society for the coming climate change. This means, for example, increasing the height of dikes, and making cooling equipment. These things one can see and feel, just as the consequences of a hurricane".

Yet, if we do not want a world in which only a rich few can survive, insulated from the heat and walled up against the sea, then we have to reject the forces which are leading us to disaster. But the choice is not whether or not industrialism should end within the next few decades — it is whether it will end with the droughts, floods and famines of climate change; through the horrific weapons which industrialism has brought us and which will be used to secure dwindling supplies of resources, food and water; or through the realization that human happiness is not dependent on increasing economic expansion. That the end of industrialism will come is inevitable, whether this really will mean the end of history, or whether it will mean the beginning of a new era, depends upon the decisions we take now.

Uranium: *Do* leave it in the ground!

Nuclear power boffins do manage to come up with some contorted arguments in their desperate search to find something good to say about nuclear power. We are now being exhorted to get uranium out of the ground so we can free the Earth, as if it cared, of its burden of natural radioactivity. In his article in the June issue of *Atom*, Nigel Holloway, a senior consultant with the projects division of AEA Technology, Safety and Reliability, tells us that we would be far better off in the long run consuming uranium in reactors if we want to save the Earth and generations into the distant future from the evils of radiation.

Paradoxical? We all know that reactors and the spent fuel they generate are virulently radioactive, so how come anyone should advocate such an approach to the problem of radioactivity? The answer lies simply in the radioactive decay processes of fissioned uranium compared to uranium left to decay in its own inexorable time. For instance, 1000 atoms of uranium-235 would, if left to decay naturally, release 40,000 million electron volts (MeV) in alpha radiation and 5000 MeV in beta/gamma radiation over the rest of time, while the same 1000 atoms, fissioned to obliteration in a reactor, would as fission products, release just 250 MeV in alpha radiation and 175 MeV in beta and gamma radiation. Indeed, from 300 days after shutdown of the reactor on to the rest of time, the spent fuel will generate barely one per cent of the radioactive energy that it would were it to be left untouched by human hand in the ground.

Nigel Holloway takes his argument for nuclear power still further. He states that because fission and fusion are the fount of atomic elements in the Universe and, therefore of life itself, then by association nothing can be wrong with trying to mimic nature on Earth by building nuclear reactors. Thus he takes us off to outer space and the creation of Supernova 1987A from the wreckage of a star known as Sanduleak - 69° 202. The purpose of this flight of fantasy, so we discover, is to tell us how much Sanduleak has in common with Chernobyl. Both events took place, or at least were perceived, within a year of each other and both involved exploding nuclear reactors, the one natural and the other man-made. He reminds us too that both reactors happened to spew their radioactive contents out over the environment.

But does he mention the appalling social and health consequences of Chernobyl? No, Holloway does not elaborate on Chernobyl as a catastrophic event that has destroyed the lives and livelihoods of tens of thousands of people and, ultimately of millions, in the Soviet Union. Instead, by confusing time-scales — as well as astrophysical and geomorphological processes — with the reality of an event experienced today, Holloway's exercise in radioactive computing borders on the macabre.

Chernobyl took place on Earth, not on some unseen object thousands of light years away, of little consequence to us other than to provide one piece of information in the jigsaw puzzle of the origins of the Universe. And even though the build-up of atomic elements in our universe is contingent on the phenomena of nuclear fusion and fission, that does not mean we should necessarily emulate those processes on Earth. As Amory Lovins remarked more than a decade ago, let's by all means have fusion, but keep it where it belongs, some 93,000 miles away on the Sun.

The real issue is what radiation does to us when it is brought to the surface of our planet, whether through uranium mining operations or through a nuclear disaster. Yet, the majority of hard-line advocates of nuclear power keep their eyes firmly shut to any event in the real world that detracts from the dream-world of safe, economic, bountiful power from the atom.

The Horrors of the Atom

Let us take a look at just a few of the horrors caused by the nuclear enterprise. In Estonia, the USSR has a uranium mine and enrichment plant at Sillimae, just across the bay from Finland. The processing of uranium is now to be stopped and the chairman of the Science Academy, Endel Lippman has demanded that soil contaminated with radioactive tailings be removed. His is not a request on aesthetic grounds; nearly 10 per cent of some 4000 children from the town have suffered hair loss, while 30 per cent are suffering skin disorders, as well as nerve damage and blood and intestinal disorders. On the Finnish side, radon levels of 160 becquerels per cubic metre (bq /m^3) have been measured com-

pared to more than 10,000 bq/m³ in Estonia. As a result of increasing concern over the dangers of radon, the United States Environmental Protection Agency has set the standard of maximum radon levels in homes as 150 bq/m³. Twelve hours a day spent at that maximum permitted level would give a dose to the lungs of 50 millisieverts (5 rems) and increase the chances of fatal lung cancer by approximately 2 per cent for each year's exposure.

Another horror story is in India, this time in Jadugoda, Bihar State, where a tailings pond from a uranium mine dried out, causing dust to contaminate villages around and leaving a toll of miscarriages, cancers, neural disorders and deformed children. The list goes on; the MAPE uranium mill in Czechoslovakia has led to an 80 per cent incidence of leukemia in cattle, while one man in his 50s who spent 30 years in Czech uranium mines, is the only survivor of 18, the rest have all died of lung cancer.

As Zhores Medvedev has already related in *The Ecologist* (Vol.20, No.1), the repercussions of Chernobyl in the Ukraine, Byelorussia and Russia itself, are just beginning to come to light. More than 220 villages and rural settlements have been abandoned and 600 villages have been included in a programme of systematic decontamination. Almost half a million people will have moved out of the contaminated zone by next year and that does not take account of millions of others currently exposed to unacceptably high levels of radiation.

Officially an area of about 10,000 km² is contaminated with caesium-137 to levels higher than 40 curies per km², with hot-spots registering levels of between 90 and 140 curies per km². The latter gives the very high reading of more than half a billion bequerels per square metre (bq/m²) to be compared with 200,000 bq/m² shortly after the accident in the worst hit areas in West Europe. A level of 150,000 bq/m² of caesium-137 would translate into cow's milk being contaminated to at least 100 times the European Commission standard of 1000 becquerels per litre. Dairy produce from both sheep and goats grazing on such contaminated pasture would exceed the limits by several hundred times.

We now have news of high rates of leukemia among children, especially in the region of Byelorussia around the town of Vetka. Cancer-stricken children are being packed five to a small room in hospitals in Minsk, where not surprisingly mortality rates are very high. In the Vetka region in general, cancer mortality rates among the population have increased from 204 per 100,000 between 1976 and 1980 to 344 per 100,000 between 1986 and 1989 — a 70 per cent rise. More than 2000 children have damaged thyroids. Of some 600,000 people brought in to help with the clean-up, some 7000 have already died. Cuba, according to reports, has now offered to treat thousands of Russian children affected by exposure to radiation since Chernobyl, and a number of others have been treated in West Germany.

No Safe Dose

We can no longer be cavalier over relatively small additional doses of radiation, especially in the light of the recent Gardner report, which showed higher than expected cancer rates among children born to workers at Britain's Sellafield reprocessing plant. The workers had been exposed to levels of radiation within authorized limits. Indeed, we are now seeing a complete turn-about in the way of thinking of those authorities, such as the ICRP (International Commission on Radiological Protection) and closer to home the NRPB (National Radiological Protection Board) regarding the effects of low-dose radiation. Having pooh-poohed the conclusions of such scientists as Alice Stewart on the effects of low dose radiation, these authorities are now accepting a far higher ratio of cancer to radiation dose than before. Witness the sudden concern over radon gas in the home and the estimates of a considerable number of cancer deaths as a result. That, by the way, is no more than Stewart has warned of over the years.

But of course, radon gas is a naturally occurring substance and with their inevitable logic, those running nuclear power installations emphasize that the levels of radon in the more exposed homes are considerably higher than would be found in the neighbourhood of nuclear plants. True, perhaps, but a natural bad does not exonerate its man-made equivalent. Secondly, and no less important, the radon gas may have a natural origin, but its coming into contact with human beings is largely anthropogenic. Where in Cornwall do you find the real radon hot-spots? Go to the tin-mining or China Clay areas where the ground has been disturbed, where tunnels running hundreds of miles have been excavated in the granite, where tailings from centuries of mining have been left, and that is where the radon problems are the most acute.

You have only to study the health statistics of Cornish tin-miners of a century ago to realize the implications of spending your working-life in a radon-rich atmosphere. Cornish miners of the 19th century had a ten-fold worse incidence of fatal lung disease than their coal-mining contemporaries, whose own life-expectancy was short enough.

That brings one back to Holloway's article. Holloway fails to consider what might be best for the Earth. He could equally well have argued that uranium serves a vital function as a radioactive heat source in the gigantic recycling of rocks and regeneration of the planet. Indeed, without uranium and some of its daughter products keeping its internal heat engine fired, the Earth might well have become too tired and eroded to have supported the evolution of mammalian forms such as ourselves. On the contrary, using the same logic that Holloway himself has used, we could bring arguments to bear that uranium should be left in the ground, not extracted from it, where at least all but the minutest amount compared to the total is able to escape its natural covering of soil and rock.

Peter Bunyard

The International Tropical Timber Organization:
Kill or Cure for the Rainforests ?

by
Marcus Colchester

When it came into existence five years ago, the International Tropical Timber Organization was welcomed by many environmentalists as offering a real opportunity to curb the excesses of the timber industry and to promote 'sustainable logging'. *Today, sustainable logging is seen to be a myth — with even the World Bank criticizing the concept — and the ITTO has proved itself hopelessly dominated by the interests of the timber trade. Hobbled by political compromise, the ITTO is incapable of addressing the wider problems plaguing forestry. Governments should no longer rely on the ITTO to halt the destruction caused by logging.*

"I do not* like *experts," he said. "They are our jailers, I despise experts more than anyone on earth."
"You're one yourself, aren't you?"
"Therefore I know! Experts are addicts. They solve nothing! They are servants of whatever system hires them. They perpetuate it. When we are tortured, we shall be tortured by experts. When we are hanged, experts will hang us . . . When the world is destroyed, it will be destroyed not by its madmen but by the sanity of its experts and the superior ignorance of its bureaucrats . . ."

John Le Carré, ***The Russia House***[1]

The world's tropical forests are disappearing faster than ever.[2,3,4] Logging, it is now thought, is responsible for a significant part of this devastation. Indeed, some studies put logging as the single greatest cause of tropical forest loss.[5] The main reason is that logging opens up previously isolated and inaccessible forests to a flood of landless settlers.[6] Tropical forest logging is also associated with the continuing denial of forest peoples' rights: it not only brings them few benefits but also undermines their livelihoods. At the same time, the timber industry has contributed to the emergence of highly corrupt and self-serving élites, whose control of the political process in developing countries is undermining democratic principles and disenfranchising the rural poor.[7,8,9,10]

Many foresters continue to hide behind their technical jargon to avoid confronting these wider issues. As one forester notes, "No silvicultural system can be given the blame for inadequate [forest] protection."[11] Yet, these wider issues cannot be wished away so easily. On the contrary, the longer foresters continue to take a narrow view of their professional responsibilities, the more vulnerable the forests entrusted to their care will be.

Within the ITTO — the body which many governments and environmental groups see as playing a major role in solving the tropical forest crisis — the narrow focus on forestry is all too evident. When combined with the dominant position enjoyed by timber producers within ITTO, it has served to ensure that the organization is little more than a lobbying group for timber interests.

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The Origins of ITTO

When the Japanese originally tabled a resolution at the United Nations Conference on Trade and Development (UNCTAD) for the creation of an International Tropical Timber Organization in 1977, they had in mind a commodity agreement, of the kind adopted for jute and rubber, which would be strictly confined to trade considerations. However, in discussions, it soon became clear that tropical timber could not be treated in such a closely defined manner. Tropical timber, coming as it does from a wide variety of tree species growing over a vast area of the world's forest, cannot be dealt with as a single commodity.[12]

The protracted negotiations at UNCTAD soon took on a more complex character. The usual group of civil servants who deal with trade negotiations were joined by foresters brought in to elucidate the technical complexities of the industry. A crucial shift in the debate came about with the intervention of the UK-based policy research organization, the International Institute for Environment and Development (IIED), which forcefully argued that the agreement could not limit itself to the technical and commercial concerns of timber extraction and trade but must also provide for the other crucial ecological and genetic services provided by forests. This was an argument that the western countries, under increasing pressure from environmental organizations back home, could not afford to ignore.

A Conflict of Interests

The International Tropical Timber Agreement (ITTA), signed in November 1983 after six years of wrangling, thus emerged as a unique trade agreement. Its most significant articles not only set the ITTO the task of promoting the trade in tropical timber, but also gave the ITTO the apparently contradictory duty of encouraging the *sustainable* use and *conservation* of tropical forests and their genetic resources, and of maintaining ecological balance.[13]

As far as the national governments playing a part in the ITTO were concerned, establishing who would control the organization was as important as establishing its terms of reference. Much

of the internal struggle during the six years between 1977 and 1983 focused on agreeing a voting system, the present structure of which reveals very clearly where the acting parties think the priorities lie.

According to the system established in the ITTA, votes are divided equally between 'producers' in the tropics and 'consumers' in the industrialized world. Consumer countries' votes are apportioned according to the degree to which they are involved in the tropical timber trade, giving Japan by far the largest vote of any single nation. Producers similarly get votes according to the amount of timber they export, with only a secondary weighting given to a country's actual area of forest. *The net result is that the more a country destroys tropical forests, the more votes it gets*. The voting structure ensures that the ITTO's primary role of promoting the timber trade heavily outweighs its secondary conservation role.

As soon as the ITTA had been signed, and before it entered into force on 1 April 1985, a further two-and-a-half-year political battle immediately ensued. This time the objectives were to define who should gain the influential role of Executive Director of the ITTO and where the secretariat was to be seated. As the horse-trading and jockeying for power developed, it was tacitly agreed that, to ensure balance, the producer and consumer blocks should share the roles: if one provided the seat for the secretariat, the other should provide the first Executive Director.

The front-runners soon emerged, with the United Kingdom, the Netherlands, Brazil, Indonesia and Japan leading in the race to provide the seat, and with the Malaysians and Dutch having the most likely candidates as Executive Director. The Dutch, in particular, took strong exception to the proposal to have Japan host the secretariat, apparently fearing that the ITTO's conservation goals would be subverted by the powerful vested interests of the Japanese timber trade. As the negotiations continued, regional groupings emerged, the two blocks of North and South themselves splitting, to a substantial extent, between East and West. Divided in this way, no groups were able to secure the required two-thirds majority of votes to allow a definitive solution. As the ITTO limped from one meeting to another, the prospect of it actually getting down to work became frustratingly remote.

The uncertainty ended when the Japanese Government offered several million dollars to fund the ITTO, as well as free office premises and secretarial functions, and, in addition, undertook to underwrite the costs of bi-annual Council meetings both in Yokohama and overseas. At the same time, Japan effectively secured the support of a number of producer countries, particularly in Latin America and Africa. The close and existing trade ties between Japan and the Southeast Asian nations provided them with more natural allies in that region. In exchange, the Japanese agreed to promote the appointment of the Malaysian forester, Dr Freezailah, to the post of Executive Director.

As Charles Secrett, then Tropical Rainforest Campaigner of Friends of the Earth (FoE) UK recalls: "The gossip was that they (the Japanese) were setting up preferential trading deals to secure Third World votes to support Japan's position." [14] The effective, if well-disguised, domination of the ITTO process by the Japan-SE Asia axis needs to be constantly borne in mind when the ITTO is being evaluated.

Unreal Expectations?

In 1986, after nine years of negotiations, the ITTO could finally get down to work. In his opening address to the International

"The voting structure ensures that the ITTO's primary role of promoting the timber trade heavily outweighs its secondary conservation role."

Tropical Timber Council (ITTC), Dr Freezailah likened his task to a canoeist swirling down a foaming river with a two-handled paddle, one end of which represented conservation and the other utilization. Only by reconciling the two objectives, he argued, could the long-term future of the timber industry be assured, while reliance on any one end would inevitably lead to failure. [15]

For their part, many Non-Governmental Organizations (NGOs) welcomed the ITTO, perceiving that it offered a real opportunity to curb the excesses of the logging industry. Some even hoped that a strict enactment of the ITTA would mean ITTO assistance in establishing national parks as a means of realizing its conservation objectives.

But the main reason that these NGOs have supported the ITTO was their belief in the concept of *sustainable logging*. Many organizations — such as FOE, the International Union for the Conservation of Nature and Natural Resources (IUCN) and IIED — saw the achievement of this objective as a key means to saving the forests and believed that the ITTO provided a means of enforcing it.[16] According to Jeffery Sayer of the IUCN, for example, "One of the best uses of forest that can in theory retain *most* species of animals and plants is natural forest management for timber production." [17] The IIED has gone even further, arguing that "it is a fact that sustainable management is technically feasible" and that "the sustainable management of natural forest for timber production is one of the keys to forest conservation and to the timber trade". [18,19]

Other organizations have been more cautious and have thus found themselves promoting what are potentially internally inconsistent arguments. Thus the WorldWide Fund for Nature (WWF), on the one hand, admits that "an important question which has yet to be answered is whether tropical forests can be managed sustainably (i.e. without significant ecological impoverishment), while yielding adequate revenue to producer countries". Yet, at the same time, the WWF argues that the ITTO "provides a forum for establishing trade mechanisms which discriminate in favour of sustainably produced timber". [20]

The Myth of Sustainable Logging

The fact that practically everyone who addresses this thorny topic has their own notion of what 'sustainable' actually means, provides one of the main sources of confusion in this debate.

As made popular by the Brundtland Commission, the phrase 'sustainable development' refers to the means by which development is made to meet the needs of the present without compromising the ability of future generations to meet their own needs. [21] Since the needs of future generations are undefinable and the future potential for wealth generation of species and ecosystems are equally unknowable, the term apparently implies that total biological assets are not reduced, in the long term, through use.

In terms of tropical forests, such sustainable use would include not just maintaining timber resources and conserving biological diversity, but also maintaining the ecological functions of forests

Logging in Sarawak: The Facts

Some 70 per cent of Sarawak's forests have been leased out to loggers. The forests are being cut at some 300,000 hectares per year, at which rate the primary forest will be practically logged out in 7 to 12 years. Logging concessions are handed out by the Chief Minister who is also the Minister for Forestry. Nearly all State Assemblymen have logging interests. One of the largest concessions is held by the Minister for Environment and Tourism.

Logging roads have been pushed across areas cultivated by native people and their burial sites have been disturbed. The intensive logging of primary forests has caused a serious decline in game. Mean intakes in protein have declined from 54 kg/person/year to only 12 kg/person/year according to a WWF study, while a Sarawak Government study shows that, in recently logged areas, there is a threefold increase in serious malnutrition in native communities, affecting some 31 per cent of the population.

The accelerating forest loss is also leading to increased soil erosion and rapid surface run-off, causing the visible pollution of streams and rivers, muddying drinking and bathing waters, blocking piped water supplies and causing stocks of fish to crash, so further impoverishing the local diet. Government figures reveal that some 60 per cent of Sarawak's rivers suffer such pollution.

The destruction of the native peoples' environment is denying them access to forest produce, for making baskets, for constructing canoes and longhouses, for their medicines, arrow poisons and blowpipes, for resins, fruits and dyes. Logging is also directly affecting native people working in the lumber camps, where mortalities are some 21 times the rate found in Canada.

About 220,000 native people in Sarawak depend on the forest. Their ways of life are being undermined by the logging, which is destroying the forests that they depend on. Since March 1987, native people have repeatedly blockaded logging company roads to prevent the destruction of their lands. The Government has done nothing to address the native peoples' grievances or curb the logging. Instead, the army, the police and forest guards have sought to intimidate the local people. There have been many arrests, most under a new law passed in November 1987 which makes the obstruction of logging roads a criminal offence. The latest blockades went up in late July 1990. To date, there have been over 300 individual arrests.

such as soil quality, hydrological cycles, climate and weather, and downstream fisheries. It should also imply maintaining supplies of other forest products — game, fruits, nuts, resins, dyes, construction materials, fuelwood etc. — essential to the livelihoods of local people.

Logging, which inevitably simplifies forest ecosystems, can never be sustainable in such terms. Indeed, as Lee Talbot, an ex-director of the IUCN and now environmental officer for the World Bank's Africa Environment Unit (AFTEN), points out:

> "In practical terms, no commercial logging of tropical forests has proven to be sustainable from the standpoint of the forest ecosystem, and any such logging must be recognized as mining, not sustaining the basic forest resource."[22]

It is all the more surprising, therefore, that the IUCN continues to refer to such logging of forests as 'sustainable', without defining how much biodiversity can be lost or must be maintained to qualify for this epithet.

Sustained Yield Management

Even if one accepts the more limited concept of 'sustainability' popular amongst foresters, that of 'sustained yield management', it is doubtful whether sustainable logging is possible. 'Sustained yield management' refers to logging practices which do not result in more timber being removed than a forest is capable of regenerating on a continuing basis.

In 1988, an IIED-led survey of the timber industry carried out for the ITTO concluded:

> "The extent of tropical moist forest which is being deliberately managed at an operational scale for the sustainable production of timber is, on a world-scale, negligible."

Indeed the study found that less than one eighth of one per cent of tropical forests, where timber extraction is occurring on a *commercial* basis, were being logged sustainably.[23]

Even this assessment has now been seriously challenged. Dr Aila Keto of the Rainforest Conservation Society of Australia carried out a detailed field study of logging in the rainforests of Queensland — extolled by the IIED as a shining example of sustained yield management. She found that the Queensland case should be excluded on two grounds. The first was that, far from being commercially viable, forestry in Queensland was heavily subsidized with public money. Moreover, she found that the actual sample plots on which the estimated rates of timber regrowth were based, were hopelessly unreliable. In sum, the evidence that commercial logging in Queensland was practised on a sustainable basis does not exist.[24] The data, on which the IIED study had based its findings, is, she claims, "at best bad science or, at worst, scientific fraud."[25]

Many other professional foresters are also very unsure that sustainable logging in natural forests is achievable. As Hans Lamprecht has noted:

> "The pressing question of to what extent a natural tropical forest ecosystem may be modified for economic reasons without seriously impairing its ability to function and survive cannot be answered on the basis of the present state of knowledge."[26]

The major funding agencies are also getting cold feet about the notion. Lee Talbot of the World Bank notes: "It appears that true sustainability from natural tropical forests has yet to be proven." Noting that most logging in Africa has led to serious deforestation and that the funding of logging in intact forests contradicts the World Bank's policy commitment to 'sustainable development', he observes that "obviously, the Bank . . . should not support further exploitation of [intact forest areas] for timber production."[27]

The main obstacles to sustained yield timber extraction are not so much technical as political, social and economic — as amply demonstrated by the example of Papua New Guinea (*see* George Marshall, this issue), and by the social pressure on forests from

landless settlers. Unfortunately, foresters and the ITTO seem reluctant to tackle these issues.[28]

From Logging to Plantations

Robert Goodland and others at the World Bank believe that truly sustainable logging in natural forest can only be achieved at an extremely low level of cutting, to the point where plantation forestry, even of slow-growing hardwoods, is likely to become financially competitive.[29] These conclusions are indirectly reinforced by the findings of Roger Sedjo and Kenneth Lyon of Resources for the Future, who concluded in a recent study that industrial wood prices are unlikely to rise for the foreseeable future.[30] This tendency may be reinforced by the recent cut in tariffs on tropical timber products negotiated in the current Uruguay Round of the General Agreement on Tariffs and Trade (GATT). Goodland and his colleagues argue that the World Bank should halt its financing of logging in natural forests and switch to promoting plantation forestry as the only truly sustainable alternative.[31]

Even this faith in plantation forestry may be misplaced. As Lamprecht warns us, "On no account should it be lost from sight that a high degree of diversity is indispensable if the ecosystems of moist tropical forests are to retain their ability to function."[32]

The World Bank's conclusions should also signal a clear warning to those conservationists who have too readily clutched at the notion of 'sustainable logging' as a way of salvaging some biodiversity. They may find that in the end their support has been used as justification for tree monocultures, a prospect as remote from their hopes of preserving biodiversity as clear-cut logging. The IUCN, it seems, has just woken up to this realization. As Jeffery Sayer noted in testimony to a House of Lords inquiry:

> "We now fear that what is going to happen in the tropics is that governments will find that natural forest management is too difficult and will gradually move away from it . . . I think it is significant that, in Indonesia, the Reafforestation Guarantee Fund which contains an enormous amount of money — it runs into millions of dollars — and which was intended to be used to compensate concession-holders who did apply the selective management regulations . . . will be used instead to fund plantations."[33]

Sustained Dissimulation

Despite the findings of its own studies, which show that sustained yield logging is practically nowhere being achieved, and despite the fact that the ITTO has yet even to agree on a definition of sustainability, sustainable logging remains the ITTO's immediate goal. During its 1990 annual meeting in Bali, the Council moved further into the realms of fantasy by announcing 'Target 2000', whereby all trade in tropical timber was to be supplied from sustainable logging within ten years.[34]

The resolution, which was proposed by a united caucus of producer nations, was at first received with incredulity by delegates from the consumer countries, who, striving to remain true to a reasonable definition, felt that restricting the trade to sustainably produced tropical timber was practically equivalent to the trade's extinction. Despite these hesitations, the resolution was passed, leaving the NGO representatives scratching their heads in bemusement. In fact, 'Target 2000' will present the timber industry with few difficulties, for, according to the rhetoric of the producers and traders, logging as practised *already is sustainable*. 'Target 2000' thus becomes nothing more than a formula for business as usual.

For example, Arthur Morrell of the UK Timber Trade, who is also an official delegate of the UK mission to the ITTO, claims that logging in Indonesia and Malaysia is sustainable on the grounds that both countries issue their own 'sustainability certificates'.[35] Indonesia and Malaysia have entered into an official agreement to jointly campaign against calls for a boycott of unsustainably produced timbers.[36] As part of this campaign, all 400 ITTO delegates in Bali were flown at the Government's expense to the Presidential Palace in Jakarta, where the meeting was told by the ITTO's chairman that Indonesia's committment to sustainable forest management was an example to the world.

Indonesian timber tycoons have funded adverts in the *New York Times*, extolling the virtues of Indonesian logging,[37,38] while official publications insist that sound management ensures timber supplies 'in perpetuity'.[39,40] Indonesia's Minister for Forestry, Hasrul Harahap, asserts that the forests of Indonesia are managed under a sustainable system.[41]

These are just some examples which painfully illustrate how far the rhetoric of sustainability has drifted away from reality. For example, the conclusion of a recent IUCN study of logging in Indonesia "was that concessions were generally managed very poorly. The Indonesian Selection System which legally should be applied by all concessionaires, all 500 of them, was not applied . . . (the rules) were almost totally either ignored or simply flouted, and in many cases the concessionaires were not really aware of what they should be doing. The knowledge of the (forests') ecology and species was not there, either in the forest departments or amongst the concessionaires."[42]

The IUCN's findings only echo what the ITTO's own investigations have themselves revealed.[43] As Simon Counsell of FoE (UK) notes, "The ITTO is being used as a stalling mechanism to prevent effective change. Member countries are quick to point to their membership to demonstrate their concern for the environment. Yet they are persistently failing to act on the ITTO's findings when these prove inconvenient."[44]

Regulating the Trade

As might be predicted, given the way the organization is controlled, the ITTO has moved extremely slowly to institute any effective mechanisms for achieving the promised transition to sustainability. Any moves to suggest regulations on the trade in unsustainably produced timber have been hotly resisted and even moves to monitor the trade are viewed with hostility.

A crucial pre-condition to achieve the transition, whether by incentives or trade restrictions, is for wood in the market to be labelled as to its origin, thereby allowing buyers and customs officials to be more discriminating. In 1989, when the British Government and FOE (UK) proposed an experimental project to test the feasibility of such a labelling scheme, the producer nations led by Indonesia and Malaysia blocked the project from getting approval until it was substantially modified. "What we were hoping for was a project specifically to test the feasibility of a certification and labelling scheme to trace forest products right from source to the consumer but, we fear, the project will now be so theoretical as to be largely irrelevant to the trade and consumers," explains Simon Counsell.[45]

Calls by NGOs in SE Asia for an end to logging in natural forests have been backed by vigorous campaigns in Europe,

"'Target 2000' will present the timber industry with few difficulties, for, according to the rhetoric of the producers and traders, logging as practised already is sustainable. 'Target 2000' thus becomes nothing more than a formula for business as usual."

Australia and the USA for a ban on the import of unsustainably produced tropical timber products. The ITTO has vigorously rejected any such restrictions on free trade. Proposed legislation in the European Parliament and the US Senate, which would impose such trade regulations, has been bitterly condemned by timber producing nations like Malaysia and Indonesia. The supposedly neutral Executive Director of the ITTO has been quick to take up the cudgels on the producers' behalf.

In his opening statement to the ITTO in Bali in 1990, Dr Freezailah accused those NGOs that were pressing for a halt to the trade in unsustainably produced timber, of carrying out a "simplistic", "short-sighted" and "misleading" campaign to restrict the export of tropical timber. He charged the northern NGOs with being oblivious or uncaring of the complexities of tropical deforestation and for promoting a strategy that will seriously harm Third World countries, particularly the poor. Poverty, Dr Freezailah claimed, is the real cause of deforestation. The NGO campaign of "threat" and "vilification" "is built on colossal misconceptions, confusion and obsessions... threats of fire and brimstone, alarmism and vindictiveness." [46]

The official ITTO position is that "import regulation may result in negative effects in producing countries in terms of their commitment to sustainable management of tropical forests. The regulation will at the same time promote substitution with temperate timbers and synthetic products. Such a development combined with the anti-tropical timber campaign now being mounted by certain conservation groups, will kill the trade in tropical timber. Once the trade is reduced or killed, it will eliminate the leverage of the international community to influence policies and developments regarding tropical forests." The ITTO argues that once tropical forests lose their value "as earners of revenue and foreign exchange", governments will be tempted to clear them to earn revenue by other means. [47]

Some organizations, such as the IUCN and the IIED, support this position, the IIED being opposed to any regulation on the grounds that "any appearance of coercion will be deeply resented."[48] But regulation of the trade is strongly favoured by the WWF, which has supported moves to introduce selective trade bans in the European Parliament. Entirely contrary to the ITTO's view, Francis Sullivan of WWF (UK) believes that "without regulation the trade has no future, because either there will be no forests left or no one will buy the timber anyway." According to this view, it is the *lack* of immediate and effective regulation which poses the greatest risk to the timber trade. WWF (International) is thus calling for a total switch to sustainably produced timber by 1995, to be imposed by trade restrictions if the ITTO cannot transform the trade by other means. The WWF is already looking to use the Convention on International Trade in Endangered Species (CITES) to halt trade in already vulnerable hardwood species.[49]

Giving the Forests Value

Sullivan also rejects the argument that forests will be cleared faster by governments if they cannot harvest revenue from them — and with good reason. Indeed, history shows that the contrary is the truth. For example, in Brazil, the Government has promoted the conversion of forests for agriculture for political reasons, with no attempt to realize the forests' economic value, whereas, in other areas, logging and hence forest destruction has intensified exactly because companies have found means to profit from them. The argument that forests can be saved only by making them lucrative is entirely spurious.

Hans Gregersen and Allen Lundgren of the University of Minnesota and Gary Lindell of the United States Department of Agriculture, note:

> "In fact, higher prices (for timber) have not led to sustained yield management, if anything, they led in the recent past to more rapid timber mining. This is partly because, while sustainable yield management may have become more profitable, it is even more profitable for the industry to take all merchantable timber, which often results in damage to residual stands to a point where sustained yield management becomes impossible." [50]

Moreover, it has become clear that not all producer countries are as opposed to regulation of the trade as Indonesia and Malaysia. In April 1990, Papua New Guinea's Prime Minister, Rabbie Namaliu, noted "it would be a major benefit if these (consumer) countries could support our own policy requirement for sustainable yield production by imposing their own restrictions upon tropical timber not supplied from genuine sustainable yield projects."[51]

Consumer countries, too, are likely to move ahead unilaterally in imposing selective bans if the ITTO continues to lag behind. The Dutch Parliament is already in the process of considering a ministerial proposal to halt the import of all unsustainably produced timber after 1995, having reassured itself already that such a measure would not contravene GATT. Many local councils in the Netherlands, Germany and the UK have also taken the decision not to use tropical hardwoods in their construction programmes, while some Australian trades unions have refused to handle tropical timber.

A Consumer Boycott

In the absence of selective bans, or at least accurate labels defining a product's provenance, a complete consumer boycott of tropical timber products seems inevitable.

What the ITTO favours instead of such disincentives is a voluntary code of improved forest management which national governments would be urged to adopt in their own interests. Initially, attempts were made at the ITTO jointly to agree binding guidelines for 'best practice', but producer governments have reacted against this too as a violation of national sovereignty. In May 1990, the ITTO agreed on non-binding guidelines, characterized by the NGOs as 'guidelines for guidelines'.

Many NGOs are very sceptical of the value of such prescriptions by themselves, noting that in many countries, like Malaysia and Indonesia, 'sustainable management' regimes are already theoretically in place, but the situation on the ground is one of rapid deforestation. What is needed, the NGOs argue, is a combination of incentives and disincentives to force the trade to improve its practice. Increasingly they are looking outside the moribund ITTO to achieve these objectives.

What About People?

Conspicuously absent from the whole debate about the timber trade has been any mention of people. The ITTO is so dominated by the thinking of conventional forestry that it has been unable to find ways of dealing with such a 'politically sensitive' question. Issues such as community-based forest management, community participation in planning, the land rights of forest dwellers, even the human dimensions of sustainability, have barely received consideration. Nor, until recently, have the NGOs done much to redress this critical short-sightedness.

The question was only raised for the first time in the ITTO's 1988 meeting in Rio de Janeiro, when FOE adopted language drafted by the human rights group Survival International urging that the rights of forest dwellers to their lands should be respected in the handing out of logging concessions. At the November 1989 meeting of the ITTO, Survival International argued that the ITTO must also include the concept of sustaining forest peoples' livelihoods in its working definition of sustainability.[52] The organization has repeatedly called on the ITTO to respect the rights of forest peoples to the use and ownership of their traditional lands, a call which has now been taken up by most of the other NGOs attending ITTO functions.[53] This concern was echoed by Prince Charles who counts himself "among those people who find it disturbing that [the ITTO's] Articles of Agreement make no mention of the rights and needs of indigenous forest dwellers."[54]

The Sarawak Mission

The issue of forest peoples' rights finally forced its way into the ITTO's agenda in 1989, as international indignation about the escalating conflict between loggers and native people in Sarawak became too heated to ignore. At the May 1989 meeting, in Côte d'Ivoire, the ITTO adopted a resolution to send an official investigative mission to Sarawak with the aim of assessing "the sustainable utilization and conservation of tropical forests and their genetic resources, as well as the maintenance of the ecological balance in Sarawak... with a view to ensuring their optimum utilization."[55]

As publically presented, the idea of the mission originally came from the ITTO, promoted by the Malaysian Executive Director, Dr Freezailah. It transpires that, in fact, it was the Malaysian Government itself that requested the visit. Sarawak's Chief Minister travelled personally to the Côte D'Ivoire meeting. Evidently the Malaysian authorities hoped that such a mission would demonstrate to the outside world their willingness to deal openly with the controversy. Many NGOs, however, feared that the mission was a smokescreen which would obscure the lack of real progress being made within Sarawak to resolve the conflict of interests between loggers and forest dwellers.

Sahabat Alam Malaysia (SAM), the environmental organization which has most closely supported the native resistance to logging, was quick to voice concern about the mission. "Our fundamental objection to the mission is that it is unable to function objectively because of its vested interest," noted SAM's President, Mohammed Idris. "A truly independent study of forest management in Sarawak would require terms of reference which do not presume that timber is the primary value of the tropical forest."[56]

Subsequent events proved these misgivings well founded. In the first place, the 'terms of reference' of the mission did not explicitly direct it to investigate the social impact of logging, much less the legitimacy of the native peoples' grievances. Moreover, the ten member team, composed as it was of foresters and economists, was ill-prepared to look into such matters. Yet, had it chosen to do so, the mission could have interpreted the concept of 'optimum utilization', as laid down in its terms of reference, as referring to all forms of forest use, not just the extraction of timber. The concept of 'sustainability' could also have been taken to include a concern for sustaining local livelihoods, particularly as the official Forest Policy of Sarawak itself sets the 'prior claims of local demands' above the 'export trade in forest produce'.[57]

"In practical terms, no commercial logging of tropical forests has proven to be sustainable from the standpoint of the forest ecosystem, and any such logging must be recognized as mining, not sustaining the basic forest resource."

Lee Talbot, Environmental officer for the World Bank's Africa Environment Unit, 1990.

In the event, the mission chose a narrow interpretation of its task, which it defined as being "to assess the sustainability of forest*ry*", thereby marginalizing not only human considerations but also alternative forms of forest use.[58] The mission made no serious attempt to evaluate the importance of non-timber products in the local economy, although many of these products are vital to the lives of local people.

Even as the mission progressed, NGO concerns were sharpened. Mission members made clear that a priority in their minds was that the mission itself should be *replicable*. In other words, the mission could not probe too deeply into issues that might reflect badly on Sarawak government, because, if it did, other producer nations would be very unlikely to allow similar ITTO missions into their own countries in the future. This 'lowest common denominator' approach clearly implied that social considerations would get short shrift.

Moreover, the first of the mission's three visits to Sarawak was entirely chaperoned by the Sarawak Government. Careful guidance by government officials continued during the course of the investigation. The ITTO's Executive Director also accompanied the mission on each of its visits to Sarawak. Thus, although the mission did meet with native people, these meetings nearly all took place in formal settings, usually in government buildings with officials looking on.

Despite receiving many written invitations, the mission visited none of the settlements which had complained most about the impact of logging. Of the two communities that the mission did visit, one was a model village seen during the first government-guided tour, while the second attracted the mission because it was in the vicinity of a proposed national park. Lamely the mission report concluded that it had been unable to investigate any of the grievances noted by the native people.[59]

Despite these limitations, and before the investigation had even concluded, one mission member felt authorized to write to the US Government alleging that the suggestion that there was rural opposition to logging "is contrary to the findings of the ITTO mission. Throughout the country, one group after another,

"The argument that forests can only be saved by making them lucrative is entirely spurious."

including rural community leaders, told us they favored logging."[60]

Meanwhile, from the Sarawak Government's point of view, the mission was proving a publicity success. Long before the mission actually reported to the ITTO, banner headlines in the local newspapers shrieked 'Top marks for our forest management', citing the mission leader as stating that Sarawak's forest management system is "one of the best in terms of policy". [61]

Ignoring Native Rights

NGOs were quick to criticize the mission report when it appeared. In its opening chapter, the report revealingly refers to the '"native peoples question" as an "awkward difficulty" and it was clearly not one to which the mission members gave much priority. Of some 260 publications to which the mission referred, there was not a single anthropological text. The report made no attempt to assess how many people live in the forests or are dependent on them for their welfare. [62]

Despite the fact that what the native people had been demanding was a mechanism to secure their land rights, the report made no such recommendations. While noting that extensive areas under 'native customary rights' exist in Sarawak — and that these rights present a problem to the management of Permanent Forest Estate (PFE) — the report simultaneously advocates a considerable expansion of PFE without providing a means of resolving conflicting land claims. "This is a formula for further increasing land disputes in Sarawak," stated Harrison Ngau, a native Kayan who runs the SAM office in Sarawak. [63]

Lawyers working with the native people in Sarawak were also very disappointed by the mission's cavalier attitude to legal issues. Lacking a lawyer, even though this had been strongly urged before the final team membership had been announced, the mission team was obliged to note that it "was not competent to address land rights matters". Notwithstanding, the report went on to make categorical statements on native peoples' land rights. Chee Yoke Ling, a lawyer at the Penang-based Asia-Pacific Peoples Environment Network, is concerned that these statements could prejudice future attempts to resolve the legal problems in Sarawak:

> "An examination of the document reveals fundamental misunderstandings of the law on the part of the mission. In their meetings with native leaders the mission members adopted a lecturing tone and made misinformed statements about the nature and extent of the natives' legal rights."[64]

Many observers believe that one of the main problems in Sarawak is the way that the handing out of logging concessions is tightly controlled by politicians, who share them out amongst themselves to maintain their wealth and power. With logging so directly benefiting the political élite, the forestry service is ill-placed to insist on careful management or a concern for local communities.[65] Yet, this was not an issue that the mission chose to investigate. Indeed, according to one mission member, the possibility that timber concessions "are concentrated in the hands of friends or family members of political élites [does not] serve any purpose relevant to the study . . . if true it might even favour rather than discourage good forest management, since it would then be necessary only to convince the political élite, who then presumably could force their cronies into line." [66]

Professional Compromise

NGOs have also criticized the report's professional competence. The mission only recommended a 30 per cent reduction in the annual cut, simultaneous to the introduction of across-the-board improvements in the forestry service. According to WWF (International), instituting such improvements could take up to half a century to take effect — by which time there would be no primary forests left. "Using the mission's own figures for forest timber yields, a 60 per cent reduction seems to be what the mission should have called for," notes Christopher Elliott of the WWF. [67]

Despite all these serious shortcomings, what the mission did reveal about Sarawak's forests has shown that environmentalists' concerns were amply justified. At present rates, the primary forests of Sarawak available for timber production will be all logged out within eleven years. The mission found ample evidence of poor logging management and practice, and consequent forest degradation and ecological problems. [68]

Many NGOs considered the Sarawak study to be a test case of the ITTO's competence. What it reveals very clearly is how the ITTO subordinates human and environmental considerations to the interests of the timber industry. The mission is a clear example of what Vandana Shiva calls the 'violence of science', the narrow view of experts riding rough shod over the needs and views of local people.[69]

The Future of the ITTO

Under the terms of the ITTA, the ITTO is an independent organization controlled by a council made up of member countries, that has a set term of authority of five years. The Council (ITTC) is empowered to extend its term by up to two terms of two years each if it so decides. The ITTC has already invoked this power once and, if it does so again, its authority will lapse in 1994 when the ITTA is either renegotiated and extended or the ITTO is dissolved. Renegotation of the ITTA would, under normal circumstances, take place under the auspices of UNCTAD, in Geneva. However, timber interests in Japan and SE Asia are keen to control the process as much as possible and are pushing to have the ITTA renegotiated at a special meeting of the ITTC itself in Yokohama. In this case, a second UN Conference would be necessary to ratify the second ITTA.

Either way we can be pretty sure that the ITTO meetings in 1993 and 1994 will be completely taken up by the renegotiations, leaving precious little scope for the ITTO to make any substantive progress. Governments would do well to look elsewhere if they are hoping to achieve any rapid transformation in the tropical timber trade. At the 1989 meeting, in a joint statement to the Council, the NGOs expressed their disappointment that "despite 15 years of negotiations, the ITTO is still not able to decide what to do to manage tropical forests, or even how to define sustainable management. During these years of vacillation, 160 million hectares of tropical forest have been destroyed."[70]

This article has attempted to demonstrate how this lack of progress is structurally inherent in the ITTO. Hobbled by political compromise and dominated by the interests of the timber trade, the ITTO's narrow scope is reinforced by scientific expertise which hesitates to address the wider problems plaguing forestry and the tropical forests. In the words of Jack Westoby:

> "Here we come to grips with what I consider is the worst crime that can be laid at the door of foresters; they have conducted themselves as conscientious, loyal and obedient public servants . . . and in so doing they have failed in their civic responsibilities . . . the forester, like any professional scientist or technician, has a responsibility to the hand that feeds him. But this is not the end of his responsibilities. He also has a responsibility to the community-at-large, to society, to the public.
>
> "Take for example, the professional foresters of the developing countries of SE Asia. In many of these countries, the forest resource is being recklessly pillaged in response to overwhelming local political pressures. The local forester, isolated, lacking political allies, is powerless to check this process — indeed is often an accessory. His situation is not helped when he sees the [expatriate] forester . . . condoning practices that he would never dream of allowing on his home ground. If the expatriate forester were more conscious of his social responsibility, were truly alive to his basic ethic, he would feel an obligation to counter and expose unacceptable practices."[71]

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The Political Economy of Logging:

The Barnett Inquiry into Corruption in the Papua New Guinea Timber Industry

by
George Marshall

Timber traders and mainstream conservationists argue that the environmental destruction caused by logging can be overcome through better management and policing. But, as the experience of Papua New Guinea graphically illustrates, logging companies are not interested in conservation. Their aim is to make as much money as quickly as possible and they will go to any lengths to achieve this. The industry is corrupt and corrupting. Such political realities make sustainable logging a pipedream.

In 1987, a public war of words in Papua New Guinea's press and parliament over the competence of the Forest Industries Council led to public accusations of tax fraud and dishonesty. As a result, in May 1987, Paias Wingti, the then Prime Minister, set up a Commission of Inquiry into the operations of the timber industry in Papua New Guinea (PNG). The inquiry, chaired by Judge Thomas Barnett, laid bare the timber trade in simple and uncompromising terms, revealing an industry that has expanded without control; in which corruption and abuse of privilege are rampant at all levels; and which has shattered the hopes and livelihoods of the poorest people in the country.

The findings of the Inquiry directly challenge a number of myths about the tropical timber trade promulgated by the industry, governments, organizations such as the World Bank and, sadly, some environmental groups. This accepted view holds that logging in the tropics can be sustainable given the right logging controls. Companies are assumed to act responsibly if they are given the right business climate and adequate financial returns. Failure to achieve sustainability can therefore be put down to lack of monitoring and lack of incentive to companies to follow sustainable methods.

The Commission of Inquiry provides plentiful material to refute this view. For all intents and purposes, the tropical timber industry can neither be monitored nor controlled. As it operates over huge areas in some of the most inaccessible regions of the world, strengthening forestry institutions cannot ensure adequate monitoring. Moreover, as the PNG case illustrates, the potential profits for the unscrupulous are vast. Within such a context, bribery is an investment, and it is clear that corruption in many sectors of the PNG economy originates with a concerted effort by companies to 'invest' in influential politicians. The opportunity for corruption is likely to be even greater in many other tropical countries; corruption in PNG is still largely limited to the upper echelons of the government.

When the political and economic forces behind an industry so clearly reward criminal acts and destructive logging, it is pointless even to discuss sustainable logging, and the assumptions made by governments and development organizations are shown to be totally untenable.

Foreign Control

Although the PNG Constitution calls for "strict controls on foreign investment to stop it attaining a position of dominance that would compromise PNG's national integrity", it is clear that the timber industry has fallen into foreign hands. As in all other South East Asian timber exporting countries, Japan has become the dominant buyer and trader. It currently imports over 60 per cent of PNG's log exports, and is the entrepôt for much of the PNG log trade to other South East Asian destinations.

Companies which are known to be Japanese-owned or Japanese-controlled hold logging permits over 1,028,903 hectares — 52 per cent of the 1,996,027 hectares currently being logged.[1] It is likely that the true extent of Japanese control is far greater than this.

Some of the logging companies are owned outright by Japanese parent companies. Jant, for example, is a wholly owned subsidiary of the Honshu paper giant. Sumitomo Forestry Co.; Open Bay Lumber company and Shin Ashigawa New Guinea are all wholly owned subsidiaries of Japanese companies, Sumitomo Corp., Sobu Tsusho, and Shin Ashigawa Japan respectively. Stettin Bay Lumber Company (SBLC) is 83 per cent owned by Nissho Iwai. All of these companies sell most or all of their production to their parent companies, an arrangement that greatly assists tax fraud.

In the case of other companies, true control is concealed. Gaisho NG is theoretically a wholly owned subsidiary of Gaisho Japan. In fact, it was created with backing from its two largest customers, Sanyo Kokusaku Pulp and Maruni Mokku, to supply them with underpriced logs for processing. Both Kamusi Timbers and United Timbers appear to be independent companies but are, in fact, financed by their sole customers, Sumitomo Corp. and Mitsubishi respectively.[2] Most non-Japanese timber companies operating in PNG are also foreign owned. The largest of these is Vanimo Forest Products, a wholly-owned subsidiary of Bunnings

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Ltd. of Western Australia. Other foreign companies such as Angus Trading and Wawoi Guavi Timber Co. have manipulated their shareholdings to give the impression of being nationally owned.[3]

Corruption

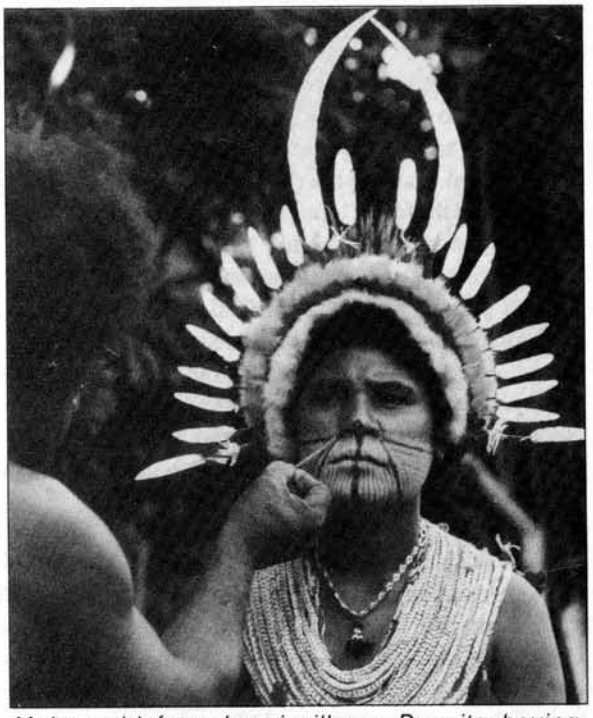
Of the timber industry as a whole, Barnett comments: "There can be no doubt that the timber industry, *by its very nature*, is conducive to acts of a criminal nature and acts contrary to law and proper government administration."[4] Barnett found that the problem was particularly severe in New Ireland, where "bribery, corruption, and the buying of support have become so widespread that they have become a major social sickness."[5] In New Ireland:

> "It would be true to say, of some of the companies, that they are now roaming the countryside with the assurance of robber barons; bribing politicians and leaders, creating social disharmony and ignoring laws in order to gain access to, rip out, and export the last remnant of the province's valuable timber."[6]

Prominent amongst the 'robber barons' have been Francis and Michael Sia, whose activities were studied in considerable depth by the Commission. The Sia brothers, who ran two logging and marketing companies — Santa Investments and Malaysian Overseas Investment Corporation (MOIC) — in New Ireland, had spun a vast web of corruption right up to the highest levels of the Department of Forests. Entries in the Sias' ledgers showed that payments had been made to immigration and customs officers, forestry officials, many of the leading provincial politicians (including Noel Levi and Gerald Sigulogo, both sitting members for areas in which the Sias had concessions), and Roy Evera, the Minister for Posts and Telecommunications.

The Sias offered the New Ireland Provincial Secretary a salary of US$1,200 a month to "use political means or ways to achieve your goals for our company." In addition, the Sias were approached by Ope Oaeka, a minister in the Gulf Provincial Government for US$5,200, and made large 'gifts' to Ted Diro, the National Minister of Forests, Member of Parliament for Central Province and leader of the People's Action Party, the third largest political party in the house. Gifts were also made to Diro's successor, Paul Torato, the former head of the United Party which received US$54,221 in electioneering materials from the Sia brothers. Most extraordinary was the Sias' relationship with the New Ireland Premier, Robert Seeto, who, in the course of 1986, requested and received over US$90,000, three cars, an outboard motor and a personal royalty of five per cent on two timber shipments.[7]

Ted Diro, however, was the greatest timber crook exposed by the Inquiry. In 1984, Diro was advising a local landowners' company which was seeking a contractor for the valuable Gadaisu concession in Central Province. In 1985 he secretly took up a 35 per cent shareholding in Angus Investments, a Singaporean timber company, and received a Jaguar XJ6 Saloon and numerous flights from the company. In November 1985, he was promoted to National Minister of Forests, amidst much jubilation by Angus. He continued to hide his interest in Angus, and persuaded the Secretary of Forests, Oscar Mamalei, to issue the license to Angus alone rather than to the landowner company he was supposed to be advising. The senior officers at the Department of Forests were adamant that the company should not be given the concession. It had no logging experience and unknown financial status. The permit application was exceptionally poor with no follow up plan, no reafforestation plan, no details of infrastructure and no processing conditions.



Mekeo girl from Inawi village. Despite having landrights, few tribal groups in Papua New Guinea have benefited from logging. Companies have cheated them on royalty payments, actively sought to corrupt the local decision-making process, and devastated their lands.

Not only did Mamalei issue the concession, but he promised a further concession to enable another 13 years of logging. The operations of Angus were disastrous and the company eventually folded with debts of $1,664,000. Diro had expected his share of illegal transferred profits to amount to US$3,292,000, along with US$1,774,700 in 'legitimate' profits. In the end he received only US$26,324 in cash, goods and services from the company.

Whilst Minister of Forests, Diro was receiving numerous other bribes. The director of the Forest Industries Council, Michael Cowan, gave him US$1,150, Santa Investments gave him US$127,500, and Chin Ah Eng, a Singaporean timber merchant, offered up to US$390,000 for a joint business project. When another local timber baron, Bruce Tsang, was faced with the possible seizure of illegally cut logs by the Department of Forests, he donated US$5,000 to Angus. Diro then issued him with the export license. The Commission of Inquiry coincidentally discovered that Diro had received US$140,000 in party funds from General Benny Murdani, head of the Indonesian military, for reasons which were never explained. In the course of the Inquiry, Diro lied repeatedly under oath, and committed perjury on at least six occasions.

What is most disturbing in the case of Ted Diro is that far from being punished — the Murdani payment alone is treasonable — he has been consistently promoted and is currently Deputy Prime Minister.

Transfer Pricing and Undervaluing

Transfer pricing is a mechanism for secretly transferring profits offshore. Companies practising transfer pricing declare a sale price for their timber exports that is far below the true market value. If they can conceal the true payment that they have received for the timber, they can then deposit the difference between the two prices in a tax haven. This way they can greatly reduce those costs that are calculated as a percentage of the export value, such as royalties and export duty. With skilful manipulation they can reduce their declared profits to a point where they pay no corporation tax at all in PNG.

The scale of illegal profits makes a nonsense of the claim that destructive logging practices result from poor financial returns to companies. The truth is that companies are simply not interested in conservation. Raising the price of logs in order to give the forest 'greater value' does *not* necessarily ensure higher returns for the government; under present conditions, transfer pricing would simply lead to the extra potential revenue being transferred abroad. Significantly, despite the flourishing timber trade, it was not until 1986 that any logging company declared a profit in PNG.[8] The Commission estimated that transfer pricing on log sales during 1986 and 1987 averaged US$5-10 per cubic metre, causing the loss of up to US$27.5 million in foreign currency earnings. In the same period, the government lost up to US$4.27 million in company tax on the hidden profits. These losses cost the country and the government around 15 per cent of their total respective earnings from the timber industry.

Without doubt, PNG-based subsidiaries of Japanese companies are the market leaders in the field of transfer pricing. Because so many are either openly or discreetly owned by Japanese parent companies with exclusive buying rights, they can quite openly sell their timber under value, and the hidden profit can be absorbed higher up the production chain.

Stettin Bay Lumber Company made its owner, Nissho Iwai, a hidden profit of over US$3 million in 1986 and 1987 alone.[9] Mitsubishi made concealed profits of US$1.5 million through undervalued purchases from United Timbers, an 'independent' company created entirely with loans from Mitsubishi.[10] Shin Ashigawa had marketing contracts with five logging companies. Between 1982 and 1987, it declared a loss of US$82,098. In reality, transfer pricing made its Japanese parent a concealed profit of US$6.5 million in this period.[11]

Transfer pricing also operates through the overpricing of imported goods and services, which are then written off against tax. Stettin Bay paid Nissho Iwai 'technical assistance fees' of US$200,000 in 1987. Shin Ashigawa paid its Japanese parent US$325,000 for "essentially non—existent services".[12]

Whilst the Japanese companies can be singled out for attention, the Commission of Inquiry showed that transfer pricing was almost universal. Barnett comments: "All trails lead to transfer pricing . . . it soon became apparent that it was a major preoccupation of the great majority of the companies being studied."[13]

"The administration appears to be lurching from one allocation to another and from one decision to the next with no clear sense of purpose."

Misdeclaration of Species

Misdeclaration of species is another means of disguising profits but is harder to prove. High-value species are declared to be less valuable ones, or even classified under the catch-all 'mixed species'. PNG, with very diverse forest and up to 60 commercial timber species, has a special problem with this. Companies with Japanese owners or buyers write species gradings on the logs in Japanese. As few Forestry Officers have been trained to read Japanese, export declarations are often accepted on trust. Misdeclaration of species by United Timbers netted Mitsubishi US$300,000 in 1986 alone.

Clearly, the only way to avoid misdeclaration is through a close scrutiny of all export loading. This is practically impossible given the labour and financial restraints on the Department of Forests. In a number of cases, when the Commission of Inquiry appeared in concessions unannounced, they found totally unsupervised export loading. There were no grading marks at all on logs being exported by Gaisho, or on most of the logs being exported from the Wawoi Guavi concession. Unsupervised loading also allows timber companies to smuggle logs. It is not known how much smuggling is occurring, but Monarch have been found guilty of it, and there was ample opportunity in many other places.

Inadequate Monitoring

Whilst the allocation of concessions has grown exponentially, the monitoring capacity of the Department of Forests has fallen equally dramatically. One reason for this has been chronic funding shortages, and inadequate training of forestry officers. Once a poor standard has been set, it becomes the norm. "Having never seen a responsible logging operation [forestry officers] seem hardly able to even see the recklessly caused damage surrounding them: let alone to rectify it," Barnett writes.[14]

In some places the local offices of the Department of Forests were completely incapable of monitoring timber operations. At Kupiano, "the three forestry officers . . . did not even have a bicycle between them to travel to the operating sites."[15] In Vanimo, the Provincial Foresters "seem to be grossly underemployed . . . When an officer does get out to the bush he walks meekly amongst the debris in, perhaps dazed, acceptance of the mass destruction which is occurring and waits for his lift home."[16] In Popondetta, "there were no funds for transport and no vehicle on permanent allocation. The office was a very dilapidated native material building with files gathering dust on floor and tables. It burnt down after my inspection."[17] Barnett concludes:

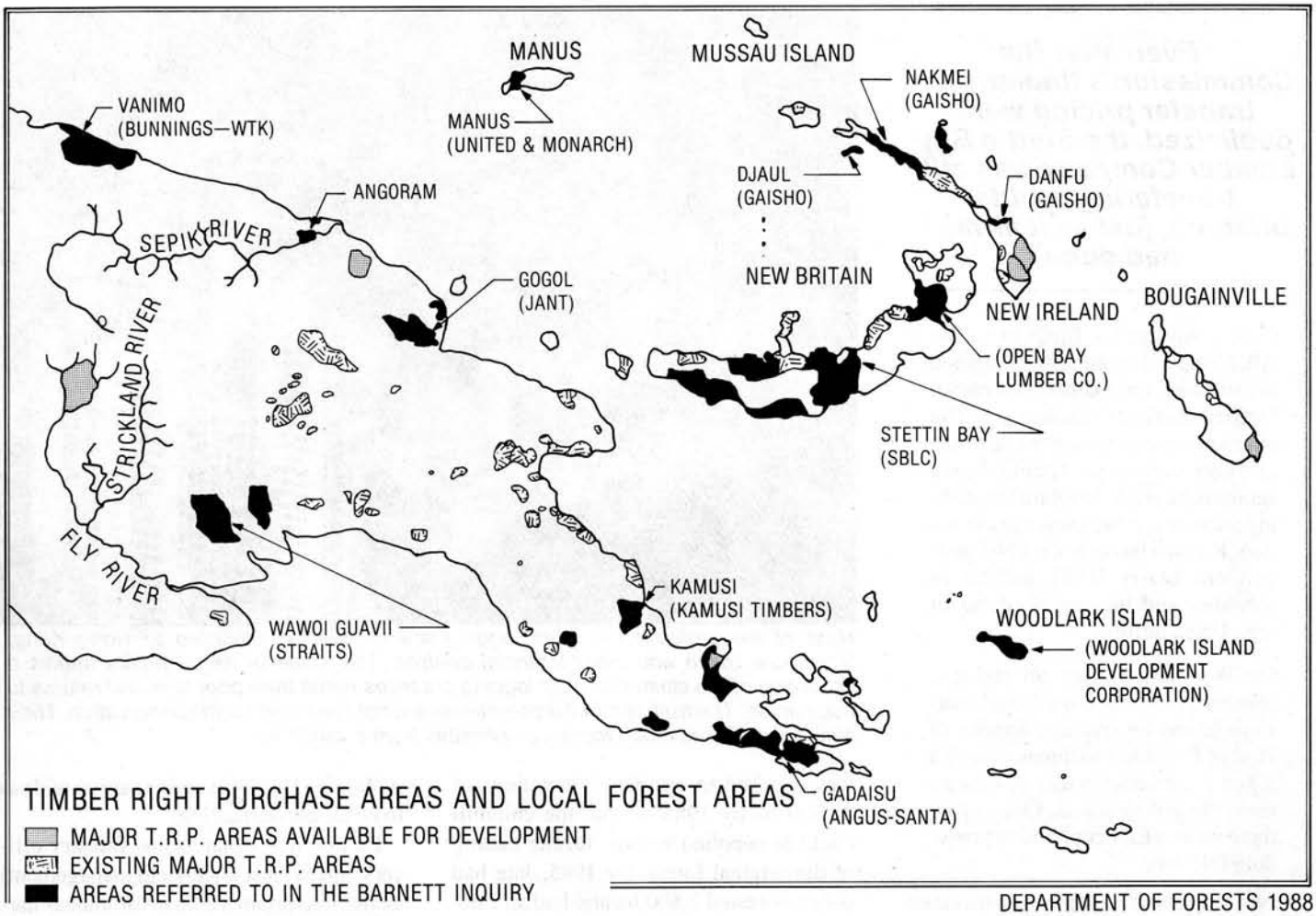
> "The monitoring of timber operations has been found to be very seriously inadequate. Not one company enterprise investigated by the Commission has a satisfactory record of performing the conditions of its operation. I know of no case where monetary damages have been imposed or a permit curtailed for failure to undertake conditions of the permit."[18]

Illegal logging is rife, yet goes unpunished:

- In Kabil, New Ireland, Sakai Management Pty. Ltd. logged out the area without a permit but was nonetheless given an export license by Ted Diro. In return, Sakai paid US$5,200 to Diro's company.[19] In 1984/85, the same company illegally logged 10,600m^3 inside the Nakmai area.[20]
- Illegal operations on Tabar Island were noted by the Commission of Inquiry in December 1987. These started again in February 1989. No attempt had been made to stop the illegal logging.[21]
- Stettin Bay Lumber Company has been conducting a multi-million dollar enterprise for seven years "on no legal basis whatsoever". Although it still has no legal authority to log, it has exported 240,000m^3 of logs a year, and processing 40,000m^3 of sawn timber.[22]

Barnett's conclusions on the Department of Forests are damning:

> "There is a fog which is casting its cloud over forestry in this country. It is a mixture of meandering intellectual neglect, bureaucratic



inefficiency and lack of honest political commitment to the visionary ideals of the constitution. Underneath this fog of inertia there are some very active timber companies in partnership with some very greedy citizens whose aim is to cut down trees and transport them to log ships. In this activity they are being very successful."[23]

Environmental Destruction

The environmental destruction caused by the timber industry in PNG is a total disgrace. The Commission of Inquiry was largely concerned with forests as a national 'resource' but, even within this limited perspective, it is clear that timber operations have been intensely destructive. Even the current Second Secretary of Forests has admitted that "the forest industry in the country can at present only be regarded as a mining operation."[24] Many of the companies had no logging experience. Straits, for example, is a marine engineering company yet was still given the 484,800 ha Wawoi Guavi concession.

Environmental clauses in logging permits are usually the bare minimum believed to ensure a second harvest of the forest and are quite inadequate for maintaining the biological integrity of the forests. They pay no heed to the importance of maintaining even those values that are so important to the landowners — in particular stocks of animals and birds for hunting. Trees which are used by the landowners for timber purposes, such as canoe building, invariably have a commercial value and are cleared out. Any area of the forest that is rich in commercial species is effectively clearfelled.

In theory, the Environmental Planning Act (1978) offers some protection. It requires that an Environmental Impact Assessment (EIA) and an Environmental Plan are submitted to the Department of Environment and Conservation (DEC) for approval. The Department can demand further conditions, or even refuse a permit application outright. However, according to the DEC, over three-quarters of the timber companies have not submitted an EIA. This alone is sufficient grounds for withdrawing their permits.

Even when companies do comply with the act, the procedure is largely a matter of form and no company has ever been denied a licence because of the ecological importance of an area. The section of the DEC concerned with timber applications employs only one man. His job description requires him to read and criticize every EIA, advise the Minister and recommend changes where needed, and visit every concession on a regular basis to confirm adherence to the environmental clauses on the permit. In reality, his role appears to largely consist of sending copies of an EIA out for comments. Environmental clauses are breached extensively:

- Gaisho ignored every one of the environmental clauses in its permit. "A number of rivers and streams were either totally blocked off from their normal course or silted with eroding soils. The once flowing crystal clear stream used as drinking water for Losu village was completely dry within six months of logging."[25] Of one of Gaisho's operations, Barnett said: "My impression of logged over areas from the air was that they looked like a dog with mange."[26]

- The Kamusi concession in Oro Province constitutes a major habitat for the world's largest butterfly, the

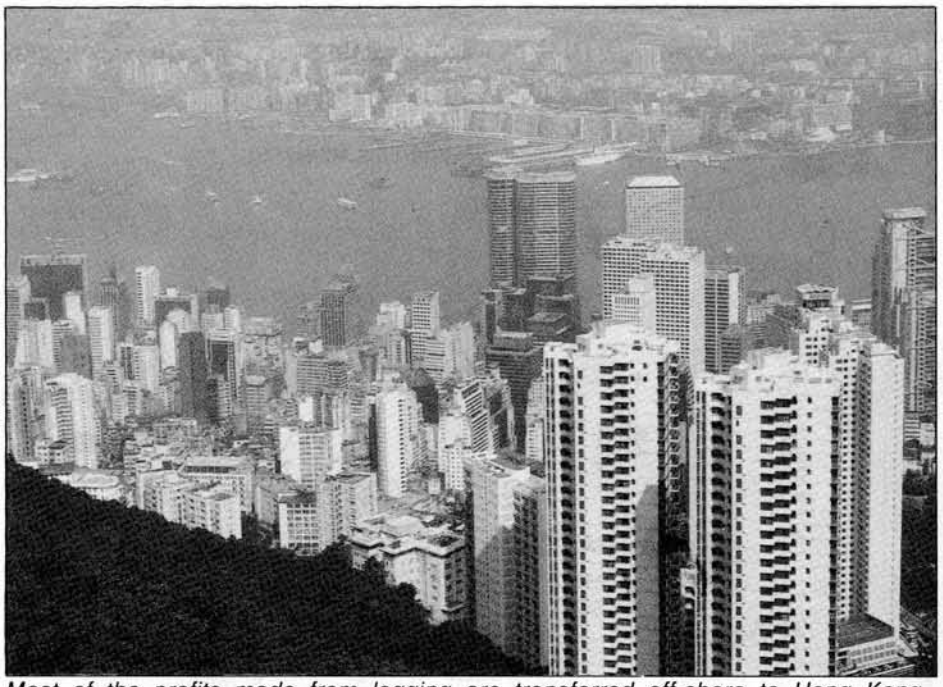
"Even after the Commission's findings on transfer pricing were publicized, the Stettin Bay Lumber Company was still transfering profits offshore, just as it always had done"

Queen Alexandra Birdwing. The IUCN regard it as an "an endangered taxa in danger of extinction if causal factors continue operating." The only known causal factor is the loss of forest habitat, yet Kamusi never submitted an EIA. In return for pushing another species closer to extinction, Kamusi has cost the PNG government nearly US$1 million in subsidies and has run up debts of over US$2 million.

- On Woodlark Island, an endemic species of Cuscus (an arborial marsupial), and an endemic species of Bird of Paradise are threatened by a logging concession that covers almost the entire island. Once again there was no EIA or planning procedure followed.

Even 'reputable' companies with extensive experience were severely criticized. Bunnings, the Western Australian company operating in Vanimo, was found to have broken all of its environmental clauses, considered some of the most stringent drafted in the country. Barnett spoke of "reckless felling", "mass destruction" and referred to one part of the concession as a "disaster area". Bunnings was in breach of all environmental conditions. There was extensive logging of slopes over 30 degrees and river obstruction. The Department of Environment calculated that 18.3 per cent of the forest had been damaged by wide snig tracks (tracks along which logs are dragged out), whilst the permit specified maximum damage of 3.4 per cent. Some 66 per cent of the few remaining trees had been damaged by the operations.[27]

Most notorious has been the Jant clearfell woodchip operation, which is one of the best studied timber areas in South East Asia. Repeated studies have noted major breaches of the environmental clauses. Webb noted that rules for the protection of streams had been ignored, with logging within 20 metres of streams and insufficient road drainage.[28] In 1990, these abuses were continuing, and the Department of Forests seemed to have no interest in enforcing the conditions. Jant



Most of the profits made from logging are transferred off-shore to Hong Kong, Singapore, Tokyo and other financial centres. The scale of illegal profits makes a nonsense of the claim that poor logging practices result from poor financial returns to companies. The truth is that the companies are not concerned with conservation. Their aim is to make as much money as possible from a single cut.

was required to establish plantations of 20,000 ha by 1985 so that the chipmill could be supplied without further cutting of the original forest. By 1985, Jant had only reforested 3,800 ha and had still not declared a profit.[29] The concession cannot sustain the chipmill, and Jant is now likely to be given a further concession to clearfell.

The operation has had a disastrous effect on the landowners. The forests around which their culture has been based are now totally destroyed, and their rich culture faces extinction. Anthropologist Colin De'Ath, has called them the "throwaway people", likening them to the cardboard products of Jant's parent company, the Honshu paper company. He describes them as "apprehensive about the future and nostalgic about the past . . . The villagers ultimately receive very little benefit."[30]

Sustainable Logging?

Throughout the PNG government, there is an assumption that the aim of timber operations is to achieve 'sustained yield management'. In truth, however, 'sustained yield management' is an act of faith rather than a proven method. The recent World Bank Tropical Forestry Action Plan Report on PNG defined methods of sustained yield as encompassing "at one extreme selective logging . . . then heavier logging with timber stand improvement . . At the other extreme is clearfelling and replanting".[31] These options are so wide as to be all-encompassing.

Barnett notes that "some forestry officers regard [sustained yield management] as the maximum volume for annual harvest which will ensure the forests will not be cut out before the end of the permit period."[32] He notes that many of the assumptions on which cuts are sanctioned are made with virtually no scientific backing. "The government is shamefully ignorant of the basic growth characteristics of our major species. The figures [of the national timber resource] in the National Forest inventory are dangerously unreliable."[33] Nor does the Department of Forests even know how large the forests are. "In so many instances, resource surveys were many years out of date, and proved to be inaccurate by as much as 100 per cent."[34]

Cheating the Landowners

Ninety-eight per cent of the land in PNG is privately and collectively owned by the traditional tribal landowners, who are supposed to benefit from logging in a number of ways. Firstly, they gain direct payment in the form of royalties and premiums which are assessed as a percentage of timber value. In some areas, rampant transfer pricing has led to undervaluing of the timber by 20 per cent and the landowners have been correspondingly cheated. Barnett concludes: "The share being re-

ceived by landowners is in fact ridiculously low."[35] The local landowner company in the Djaul LFA concession was cheated of US$263,860 because of transfer pricing by Gaisho during the period of its operations.[36] In the Wawoi Guavi timber area, landowners sometimes received only 0.65 per cent of the timber value; a paltry US 50 cents per cubic metre. Angus never bothered to pay any landowner royalties at all.

Where landowners have formed a Development Corporation, they supposedly share in the company equity, and hence the profits. However, as few logging companies ever declare a profit, there are rarely any dividends for a Development Corporation to share. The landowners received only six per cent of the total profits from the Mamirum Timbers concession,[37] whilst Francis Sia, who was working for the company, deducted "outrageous charges", in addition to claiming 75 per cent of the profits. Barnett comments:

> "In all except three cases studied by the Commission, the landowner company was a mere puppet created to enable the foreign timber companies to gain access to the resource."[38]

Landowners are presumed to benefit from various requirements placed on logging companies in their permit agreements. Such conditions vary. In some cases, they include business and economic development projects, but, as Barnett comments, "In every case studied, the results of such schemes have been failure and disappointment." Gaisho, for example, was required to clear 2,000 ha of agricultural land and establish 400 ha of cocoa plantations in the Danfu Timber Rights Purchase area. It actually cleared only 230 ha and planted no cocoa. In Wawoi Guavi, Straits made no attempt to honour its promise to build a school, a hospital, six medical aid posts, a sawmill, a charcoal plant and crocodile farms or village fisheries. Most roads built by logging companies are inadequate and will not last more than a few years. Yet roads, perceived as bringing economic development, are one of the main reasons why local people seek logging operations.

Finally, logging is supposed to provide good employment opportunities. Often, though, PNG nationals were only given the least skilled positions. "Long-term operators prefer to employ expatriate Asians and Europeans even when skilled Papua New Guineans are available. Even in semi-skilled jobs, many Asians are employed."[39] In some areas, worker and landowner discontent has erupted. In July 1976, there was a major strike by workers on the Jant concession, and, in March 1987, the landowners set up road-blocks in support of their demands for higher royalties and social services. These are still largely unmet. There have been regular strikes on the Vanimo operation, including a protest march on the provincial government by 500 employees. When the Commission of Inquiry visited the Vanimo concession, it found that the landowners were blocking roads and forcing stoppages as a matter of course. The landowners complained about damage to streams, wastage, late payment of royalties and failure to receive a fair share of profits. It might have been expected that there would be greater employment where local timber processing, such as sawmilling, was required. However, "in many cases, such operations never commenced at all."[40]

"It would be true to say, of some of the companies, that they are now roaming the countryside with the assurance of robber barons; bribing politicians and leaders, creating social disharmony and ignoring laws in order to gain access to, rip out, and export the last remnant of the province's valuable timber."

None of the companies seem to have had any real regard for the local people. The behaviour of Angus was amongst the worst. To gain quick access to a site for a log pond, it bulldozed Sabiro village and left the people to live in a shantytown on a bare hillside. The church was destroyed, graves were desecrated, and the pastor's house was occupied by the company. Promises to rebuild the village were never kept.[41]

Such abuses are continuing. In January 1990, a member of the Melbourne-based Rainforest Action Group visited the Stettin Bay Lumber Co. concession at Kuli Pagi. He found landowners distraught over the recent bulldozing of their village by the company. "Their crops had been flattened, their graves desecrated, and the water silted up and no longer drinkable."[42]

Social Dislocation

Of greatest concern is the social dislocation caused by the timber operations. Traditionally, PNG societies seek to achieve consensus on decisions regarding communal land. Such processes involve extended group discussions and can take years. The Commission found that companies sought to circumvent traditional decision-making through intensive manipulation and promises that they had no intention of keeping. In a number of concessions there were substantial numbers of landowners who had not agreed to granting logging permits at all. In the extension to the Danfu concession, Gaisho started logging although nearly half of the landowners had still not signed its agreement. In Wawoi Guavi, 415 of the 1196 listed landowners were never included in the agreement.

The companies have been greatly assisted in such underhand practices by the 1974 Private Dealings Act, under which landowners could apply to have their land declared a Local Forest Area (LFA) and could then negotiate directly with the timber companies. Previously, under the Timber Rights Purchase (TRP) system, the government leased the forest from the landowner and negotiated with the companies. The Private Dealings Act has left the field open for companies to manipulate the landowners directly and has effectively prevented any outside monitoring of negotiations. Delays in the government process can be side-stepped through intensive lobbying, orchestrated and paid for by the company. In the worst cases, competing companies have created rival groups within the land-owning clan.

In Manus, for example, a number of landowners held back their 20,000 ha from a logging operation by SEAL as they "had a genuine fear that the environment might be irreparably damaged." Two other companies, Monarch Investments and United Timbers, then persuaded rival landowner companies to have the area created as an LFA. The Monarch-controlled group won the concession through orchestrated lobbying of the Department of Forests. After four visits from the landowner company and the company lawyers, the Minister of the Environment and Conservation approved the Environmental Plan. He later told the Inquiry: "I shouldn't have done it and I have done it. The reason was that they came to my office so many times that I'm just fed up so I just said OK go ahead."[43]

In the Arawe concession, rival companies, Arawe Investments and Timbersales, were supporting rival groups of landowners. Barnett notes that "the potential for open conflict between the competing parties is clear."[44] Elsewhere, he comments: "An elderly New Ireland landowner dis-

cussing a 'timber war' between landowner groups backed by rival foreign contractors warned that when the foreigners had departed with the logs, the rival and now hostile groups would be left still trying to live together — because they had nowhere else to go."[45]

As companies are not prepared to wait for a true consensus among the landowners, differences are often still not settled before logging starts, and intensify in the face of broken promises and shattered expectations. In the Nakmai area, logged by Gaisho, Barnett "observed a disillusioned and bewildered people pondering over how their expectations of development had failed to be realized and squabbling over money 'leaking' from the trust accounts."[46]

Suppressing the Report

Barnett's findings have clearly threatened both the PNG government and local PNG élites. Indeed, as soon as the Inquiry began to reveal huge abuses of governmental power — in particular by several members of the PNG cabinet — support for the Commission diminished. Towards the end of the Inquiry, Justice Barnett was forced to negotiate extensions on a week-by-week basis. He was stabbed, nearly fatally, outside his Port Moresby home, and remains convinced that the attack was instigated by the timber companies.

Only two of the Interim Reports have been printed, and on a very limited run. The other five Interim Reports and the two volume Final Report have not been printed at all. No part of the Inquiry Report is accessible to the public anywhere in PNG, and one of those accused of massive corruption in the report, Ted Diro, is now acting Prime Minister.

The most depressing aspect of the Commission of Inquiry is that hardly anything has been done about it. Barnett himself comments:

> "Even after the publicity given to forestry malpractices... the same practices are occurring, and often the same companies and individuals are involved... even after the Commission's findings on transfer pricing were publicized, a large exporter like Stettin Bay Lumber Company was still transferring profits offshore, just as it always had done."[47]

Barnett's view is that "as soon as the Inquiry ended another has been needed."[48] Recent developments confirm this view:

"My inquiries quite definitely show that landowner participation is not happening on any significant scale."

- When the Commission's Final Report was released in July 1989, the Prime Minister, Rabbie Namaliu, announced that there would be no more Local Forest Areas issued. Four LFAs have been issued since then. In March 1990, the Central Province Finance Minister, Herman Savura, claimed that many of the companies that fled the country at the time of the Inquiry have now returned under new names. "Most of these companies have returned and have gone right back into their dirty activities that are destroying the land, environment and local people."[49] None of the people in the government mentioned as receiving or requesting bribes have been punished and the few cases against them have been discreetly dropped. Of the companies, only Gaisho has been asked to leave. Its concessions were nearly exhausted in any case.
- The Sia Brothers, and their company Santa, are still operating. Twenty cases against the Sias of corruptly offering payments to Robert Seeto have been dropped.
- In February 1990, Bunnings sold the Vanimo concession to WTK Realty for Aus$17 million (US$13 million). As the land is not owned by the company, any transfer of permit should only have been done following full consultation with the landowners. There was no consultation, and WTK has since sacked most of the PNG national staff and replaced them with Malaysians.
- In March 1990, there was a donors' meeting for the PNG Tropical Forestry Action Plan under the auspices of the World Bank. The Plan calls for forestry reform through departmental restructuring and improved legislation, whilst paying no attention to the failure to enforce existing legislation. As no account was taken of the inherent corruptness of the timber industry, such reforms will be of little value. The "reduced" "sustainable yield" level of harvest proposed under the TFAP was 2.5 times higher than the current harvest.
- Karl Stack, the current Minister of Forests and himself implicated in several logging scandals, took the opportunity of the TFAP meeting to announce a two year moratorium on the issue of new licenses starting in July 1990. In the interim, he has been handing out huge areas totalling over 400,000 ha — with even less stringent conditions than usual. In one of these, the 100,000 Josephstaal concession in Madang province, the landowners were not consulted at all, and their role in negotiations was usurped by government 'trustees'. They will receive only three per cent of the timber value in royalties. The company issued with the license, Kosmos Resources, is not even registered as a company in PNG.[50]

In response to the Barnett Inquiry, and the continuing abuses, the National Alliance of Non-Government Organizations has been calling for a ban on all export logging. The organization includes all major national environment and development groups and the Melanesian Council of Churches.[51]

Implications for the Timber Trade

The Barnett Inquiry is the most thorough and objective study yet made of the operations of the timber industry in a tropical country, and is unlikely to be surpassed. For this reason its findings have an importance that extends far beyond Papua New Guinea.

Many of the companies mentioned have concessions and interests throughout South East Asia. Transfer pricing was greatly assisted by the level of collusion between logging companies and their customers and by various forms of hidden control. Such relationships are extremely common in the South East Asian timber trade, and are surely assisting transfer pricing in other countries too. Bearing in mind the extent to which many of the companies operating in PNG are associated with some of the largest companies in the timber trade — for example, Honshu Paper and Mitsubishi — it may be assumed that the criminal behaviour uncovered by Barnett resulted from corporate policy and that responsibility permeates the entire system.

Finally, the Commission of Inquiry shows clearly that the timber industry in Papua New Guinea is effectively unpoliceable, inherently corrupt, and beyond reform. As in so many other countries, the government gives the appearance of controlling what is effectively out of control; forestry policy amounts to no more than

window dressing for free market anarchy.

It is vital that those endorsing and encouraging the timber industry, in particular the multilateral aid agencies, realize that the problems cannot be solved through more monitoring, administrative restructuring and incentives to companies. The problems arise from the huge sums of money to be made from a 'once only cut' and from the system based on tendering concessions to competing companies. Destroyed lives, social disintegration, and cultural and biological extinctions, are, by any value system, too high a cost for having one's country plundered by foreign companies.

STOP PRESS: Judge Barnett's original documentation — the evidence on which legal proceedings against offending companies and individuals would have to be based — has been destroyed in a fire which broke out mysteriously in the PNG Finance Department Building in Port Moresby.

The Inquiry Report is a key document for the international rainforest campaign and all groups and individuals who wish to understand the mechanisms of the tropical timber industry. A 35 page summary will be available in September. *The Ecologist* is now taking advance orders.Ths summary is on Greenet in the conference: reg.newguinea.

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The Ecological Impact of Over-Development:

A Case Study from the Limburg Borderlands

by
Nigel Harle

The opening up of Eastern Europe has revealed pollution on a devastating scale. However, there are many areas of Western Europe that are equally polluted, despite industry having access to superior technology. One such area is Limburg, the border region where Holland, Belgium and West Germany meet. Here the limits to growth are no longer merely of theoretical concern: they are a living reality. Those who charge environmentalists with wanting to return to the Dark Ages should consider the devastated environment of Limburg; for Limburg epitomizes the consequences of seeking progress through industrial expansion. What has happened to Limburg will happen to other areas unless we opt for change.

The so-called 'Euregio Meuse-Rhine' is a border region in the centre of industrialized Western Europe (*see* Map 1). It comprises the Netherlands' southernmost provinces, Limburg and North Brabant, and the borderland areas of Belgium and West Germany. The Euregio hinterland is one of the most highly developed and densely populated regions of the world, with an overall population of around five million. The Euregio exemplifies the declining quality of life that the over-developed North is now experiencing. As such, it provides a textbook example of how the many tentacles of unchecked economic growth have interacted to form a web that is now forming a stranglehold on human and other communities.

Growth of the Region

In the course of the 19th century, heavy industry developed rapidly along the rivers Meuse (particularly in Belgium), Rhine and Ruhr, the vital transport routes of Northwest Europe. The power required by the region's expanding industries was provided by the major coalfields of Germany's Ruhr area, Dutch and Belgian Limburg and the Belgian Meuse/Sambre valley. Although metallic ores were largely imported from further afield, many other important finite resources were readily available locally; much of northwest Europe's coal, lignite (brown coal), limestone, gravel and sand resources lie under the soil of the Euregio. By the beginning of the 20th century, the Ruhr had become firmly established as the main industrial centre of continental Europe. In northern Belgium, Liège had developed into the country's major chemical and metal-refining centre. As new road and canal networks were constructed to carry the increasing volumes of raw materials, energy feedstocks and end products, a large number of other energy-intensive and polluting industries sprang up in other parts of the Euregio borderland; in the north of Belgium, the south of Dutch Limburg and around the German city of Aachen.

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At this stage of the Euregio's development, food was still largely produced by traditional means, in an area defined by the ecological limits of the poor sandy soils of the northwest and the higher, rugged ground of the southeast. In the course of the 20th century, however, agriculture was also radically transformed, as industry developed artificial fertilizers and pesticides and mechanized machinery took over from man, woman, ox and horse. Later, high-intensity monocultures and factory farming spread, and as European and international agricultural policies took shape, farmers found that there was no way back. As in so many areas, the fertile soils of river valleys were sacrificed to industrial development, and farmers were compelled to start working poorer and hillier lands — or join the industrial proletariat in the production centres.

In the latter half of the 20th century, industrial and urban development have taken on new, unprecedented forms. Throughout the Euregio, many of the former towns and villages have now coalesced into sprawling conurbations (*see* Map 2, p.184). The open spaces in between are dissected by major transport routes, cultivated with monocultures or torn open by large-scale mining operations. Dutch land-use statistics show that in Limburg province — which is fairly typical for the whole Euregio — five per cent of the land is taken up by roads, railways and car parks, with an additional 12 per cent occupied by towns and industry or otherwise built-up. A little less than two-thirds of the land is classified as 'agricultural', 13 per cent as 'forest' and 2 per cent as 'recreational', most of these areas being intensively used. Only 2.5 per cent of the land is still classified as 'natural'. [1]

Two centuries of development have raised the per capita income of the population, brought 'mobility' and overtly reduced the necessity for heavy labour. They have provided most of the population with a house and a car and a near-unlimited choice of foodstuffs and consumer products. But, from an historical perspective, the two end results are land destruction and pollution. Much of the region's land resources have been dug up and burnt, ground fine or processed to feed the factories to supply more factories, here and elsewhere, to pave the land and to erect high-rise concrete buildings. In the process, massive volumes of pollutants have been released to the atmosphere, into rivers,

ground water and topsoil, acidifying and poisoning the soil, disrupting ecosystems and damaging health, and even making an appreciable contribution to global climatic change.[2] Yet the Euregio is home to a mere 0.1 per cent of the world's population. With additional inputs of raw materials, fuel resources and animal fodder from around the world, largely from the impoverished South, the region has moreover played its part in the destruction of other regions and communities far afield.

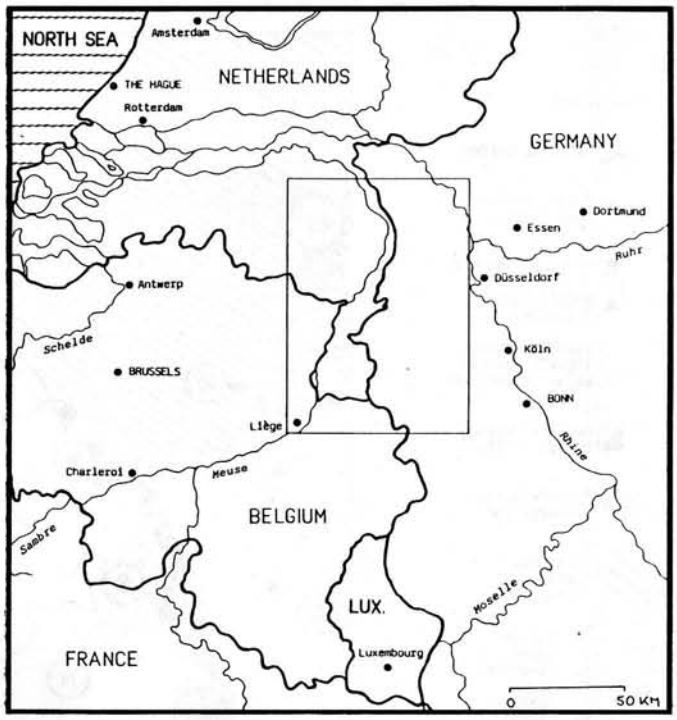
Chemical Soil Pollution

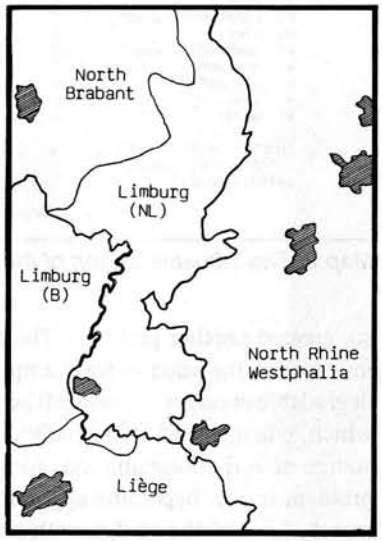
The soil of the Euregio is drenched with chemicals. In the built-up areas, the true number of industrially polluted sites is almost impossible to calculate; in Dutch Limburg alone, with an area of about 2,200 square kilometres, the latest official survey puts the figure at around 2000 sites.[3] In Belgian Limburg, where official inventories are still lacking, a recent grassroots survey showed that "in every municipality, there are dozens of illegal waste dumps, along railways, streams and canals, in woods and round derelict and operational factories."[4] For decades, waste products from ceramic, chemical, paint, metallurgical and other industries have been dumped on production sites as well as in disused quarries. The substances involved cover the whole spectrum of toxic wastes: heavy metals like cadmium, lead, mercury and zinc; organic solvents such as benzene, xylene and toluene; chlorinated hydrocarbons such as trichloroethylene; and a long list of other toxic chemical wastes. The task of 'cleaning up' all the sites in Limburg — let alone similar numbers in bordering Belgium and Germany — has been conservatively estimated as costing 900 million guilders (approximately US$500 million).[5]

One of the most serious cases of soil pollution in the region is near the old zinc and cadmium industry on either side of the North Belgian border. Around the Dutch town of Budel, an area of 140 square kilometres has been polluted with heavy metal wastes as a result of direct dumping, airborne deposition and the use of waste cinders in road construction. In the worst affected areas, with cadmium levels exceeding 2.5 grams per kilogram of soil, communities have been advised to stop eating home-grown vegetables, and the Dutch government is now considering how to finance the almost impossible task of digging up three per cent of the province. The whole operation is expected to cost half a billion Dutch guilders (approximately US$240m). There are many other locations in this part of the borderlands polluted with wastes containing cadmium, arsenic, lead and zinc. Around Lommel and Rotem, fodder maize has been found to contain 20 to 50 times the maximum permissible levels of cadmium (0.5 milligrams per kilogram dry weight).[6]

There is also extensive soil and groundwater pollution around many of the region's chemical works. One of the best documented cases is the production complex at Geleen, near Sittard, operated by DSM, a major European chemical company. Here, on one of Holland's largest single chemical production sites, DSM is mainly involved in bulk production of fertilizers, plastics, synthetic resins, fibre feedstocks, additives and intermediate chemicals for agrochemical, pharmaceutical and other 'downstream' chemical industries. Several parts of the Geleen site have been used for decades as a dumping ground for the company's chemical wastes, involving hundreds of compounds. The largest tip contains a cocktail of almost five million tonnes of highly toxic waste.

Two other waste sites, containing huge quantities of fly ash, melamine sludge and other wastes, lie along the east bank of the River Meuse, and are often inundated during spring floods. Chemicals are leaching from several tips on DSM's huge site, and have already flowed into the groundwater under the adjacent townships of Stein and Urmond and out to Sittard, five kilometres to the east. The main chemicals involved are; benzene, xylene, cyanide, petroleum oil, chlorinated hydrocarbons and sulphates. In Urmond, where the water table is close to the surface, many people have liver, intestinal and other complaints, and eczema and long-running colds are common.[7]



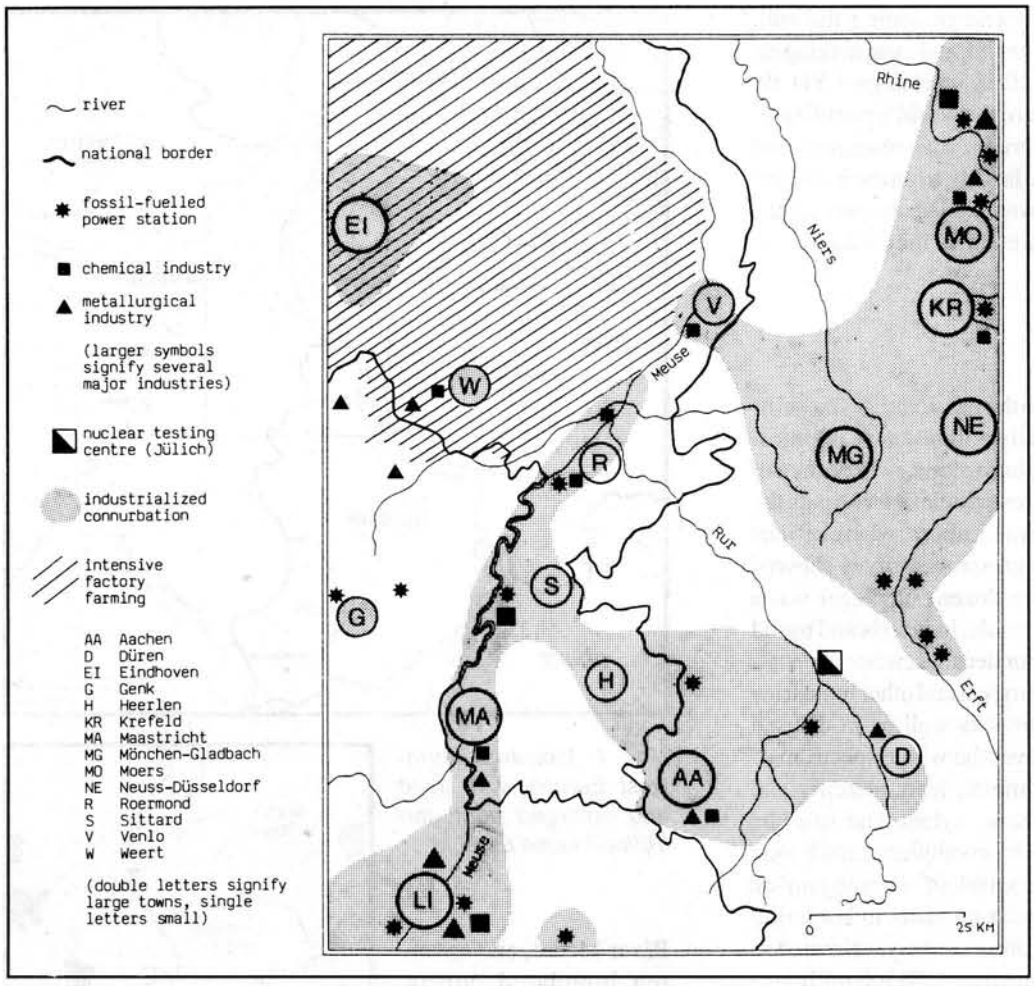


Map 1. *Industrial Northwest Europe with, inset and enlarged right, the 'Rhine-Meuse Euregio'.*

However, it is not only waste tips and large industry that are responsible for the high levels of heavy metals, chlorinated hydrocarbons and other organic chemicals in the soil and groundwater. The authorities are now waking up to the unpleasant fact that soil clean-up programmes are required at the sites of diverse small businesses all over the province; from garages, scrap heaps and transport firms through to dry cleaners, domestic oil businesses, timber yards, textile dying operations and metal-working shops.

Besides these 'point sources', the region is also confronted with widespread 'diffuse' soil pollution from four main sources: wet and dry deposition of the long-range air pollution that blows constantly over the land; deposition of short-range pollutants from traffic and urban activity; accumulation of waterborne pollutants in river and stream beds and in inundated water meadows; and leaching of chemicals from agricultural and other soils.

The water treatment plants brought on stream in the 1970s reduced the pollution burden in some surface waters but, in doing



Map 2. *The industrialization of the Euregio.*

so, created another problem. The pollutants that had been removed from the water — for example, heavy metals and non-biodegradable organics — were left behind in the remaining sludge, which, when spread on agricultural land, has become a major source of soil contamination. Although the full extent of this problem is now becoming apparent, the trend appears to be to merely 'dilute' the sludge with relatively clean soil, to bring pollutant concentrations down to the maximum limits, before distributing it for re-use, either as potting soil or as filling material for construction projects. As clean, healthy soil becomes a scarce 'commodity', a new business sector is now growing up around this open-ended 'recycling' system, which is based — in free market terms — on the 'glut' of polluted soil, harbour sludge and dredging spoil from river beds.

In the town of Sittard, owners of small plots of land were advised to stop eating their home-grown vegetables in 1987, after they had been found to contain heavy metals. Later, it was discovered that the contamination came from leaves swept up from along some of the town's busy roads and provided to gardeners for compost. The problem of heavy metals in the Limburg soil has now assumed such proportions that the provincial authorities state that "owners of private vegetable gardens should realize that the soil cannot always be used for growing edible crops."

The River Meuse

The River Meuse and its tributaries function as convenient repositories for the wastes of the industries and power stations (conventional and nuclear) of northern France, central Belgium, the western edge of Germany and the south of the Netherlands. At the same time, the rivers carry off the sewage produced by many millions of people in these regions. During the last decade or so, new environmental legislation has led to the construction of many water treatment plants in the Netherlands, and to a certain extent in the German border region. However, the countries upstream from the Netherlands are still guilty of extremely serious pollution of the Meuse, which is in many respects even 'dirtier' than the Rhine. The pollution is especially bad between Liège and Maastricht, where the vast majority of the heavy industry discharges its waste uncontrolled into the river. In Belgium, an astonishing 90 per cent of domestic waste — and only a slightly lower percentage of industrial effluents — are discharged untreated into the river.

The Meuse is a rain river, with water levels fluctuating widely in the course of the year (by a factor of between 8 and 15). As a consequence, levels of chemical, nuclear and other wastes rise dramatically in dry summers, regularly causing major ecological disasters (*see* Box 1).

The Meuse provides drinking water for some five million people in Belgium and the Dutch coastal conurbations, to be joined by another million before the turn of the century. This water has mutagenic and carcinogenic properties, due mainly to the presence of a wide variety of complex organic waste products, such as chlorinated hydrocarbons, discharged by chemical industries. Scientists have even warned of the hazards of taking hot showers with such water, as many toxic volatile organic compounds are readily vapourized and inhaled. [8]

For years, the drinking water authorities using Meuse water have been pressing for measures to reduce drastically the chemical and bacteriological burden of the river. They have also repeatedly spoken out against further expansion of nuclear facilities along the river, and are particularly concerned about rising levels of tritium, since there is no means of removing this radioactive isotope of hydrogen from the water. At present, four commercial reactors and one nuclear test centre use the Meuse as a source of cooling water and a suitable place to discharge radioactive effluents (in addition to the atmosphere). At Chooz, on the northern border of France, there is a 305 megawatt reactor dating from 1967, with an appalling environmental record. Two more reactors are presently under construction, possibly to be joined by the turn of the century by one or two more. With a rated capacity of 1400 megawatts each, these new, so-called N-4 pressurized water reactors will be the largest in Europe. In 1987, Friends of the Earth, Holland, presented a report calling for the closure of the 'dirty' reactor Chooz A, a demand publicly supported by Dutch drinking water authorities and the president

Box 1: A History of Nuclear and Chemical Poisoning of The Meuse

9 Dec. 1981 Following accident with tanker barge in Liège, hundreds of tonnes of heavy fuel oil stream into Meuse. By spring 1982, full impact of accident becomes clear: an estimated 100,000 birds have died.

Jan. 1982 Secret Dutch government report reveals serious radioactive pollution of fish and mud in Meuse. Authorities advise against eating certain species of fish.

5 Jan. 1982 In Meuse tributary, the Rur, eels found to contain high PCB concentrations (8 times maximum permissible level). Warning also issued against consumption of fish from Rur.

20 Sep. 1982 Industrial discharges in Maastricht, probably by paper industry, result in death of thousands of fish.

26 Oct. 1982 Massive fish kill at Dutch/Belgian border caused by sevenfold increase in already high cyanide levels.

5 Nov. 1982 One month after start of test run, second nuclear reactor at Tihange has emergency shut-down, losing 50,000 litres of radioactive cooling water from primary circuit. Discharge of contaminated water into Meuse suspected. Release of radioactive gases through stack. Later, company admits that situation could have developed into full-scale emergency if plant had been fully operational.

16 Jan. 1983 Tihange II shut due to faulty valve.

11 Feb. 1983 Tihange II again undergoes an emergency shut-down. Company admits accident costs about 50 million guilders, but no details of discharges given.

13 Apr. 1983 Now the older reactor, Tihange I, has to be brought to emergency shutdown, again losing 50,000 litres of radioactive cooling water. Ths time management admits that contaminated water will be discharged later into Meuse.

Aug. 1983 During low summer flow, enormous discharges of cyanide, zinc and copper compounds by Liège industries result in death of thousands of fish (20 tonnes collected). City authorities also fear for public health.

Oct.-Dec. 1983 On four more occasions, hundreds or thousands of fish die following illegal chemical discharges downstream of Liège industry. It is proved that a number of metallurgical companies have followed a regular policy of discharging the week's wastes during the weekend.

9-12 Jul. 1984 Thousands of dead fish in Seraing, industrial suburb of Liège. About 5 tonnes of fish collected. Cyanide poisoning again. No legal action is being taken against guilty firms.

Apr.-Jun. 1985 In various tributaries in North and Middle Limburg, thousands of birds and fish die as a result of excessive use of agricultural chemicals. Widespread use of such agrochemicals as endosulphan regularly leads to ecological disasters in this intensive farming area.

Aug. 1986 Thousands of fish die in River Vesdre, Belgian Tributary of Meuse, as river changes to foam following illegal discharges of chemical detergents.

5 Oct. 1986 Emergency shut-down at Tihange II; 30,000 litres of radioactive coolant discharged.

11 Oct. 1986 Another accident at Tihange; 600 litres of coolant lost.

18 Nov. 1986 Massive fish kill downstream of Tihange III, caused by heavy discharge of chlorine, used to clean nuclear power plant discharge pipes.

16 Sep. 1987 Near-catastrophe at Tihange nuclear power station when contracted worker is given wrong process diagrams and almost cuts through vital piping.

Dec. 1987 Work starts on dredging 500,000m^3 of polluted sludge from Dutch Meuse, for transfer to bed of nearby canal.

12 Dec. 1987 Dutch ministerial report reveals that almost 40 per cent of farmland along the Geul, a tributary of the Meuse, is unsuitable for crops or grazing due to heavy metal pollution.

1 Apr. 1988 Vegetable gardeners along banks of Meuse and all Dutch tributaries advised to stop growing certain crops, due to soil pollution from river.

2 June 1988 Stein harbour sludge found to be seriously polluted with lead; 10,000m^3 requires special treatment.

5 July 1988 Dutch ministry permanently bans cultivation of cereals for human consumption anywhere along banks of Meuse and its tributaries; along the Geul, the ban is extended to all leaf vegetables.

22 June 1988 Emergency shut-down of one reactor unit at Tihange after leakage.

12 Aug. 1988 Stein harbour found to be even worse off: 115,000 m^3 of sludge polluted with lead, cadmium and oil will cost 20-40 million guilders to handle.

11 Nov. 1988 Fish kill in Liège harbour; water turns orange.

22 Nov. 1988 Drinking water intake (sic) from Meuse stopped after Belgian companies raise cadmium levels to 40 times limit.

2 June 1989 Elevated concentrations of radioactive cobalt in Belgian and Dutch Meuse, discharged from Tihange.

20 Oct. 1989 Municipalities along Dutch Meuse announce that at least 1.5 million m^3 of polluted sludge needs removing from harbours, costing up to 45 million guilders.

21 Nov. 1989 Fish kill in Liège harbour as water turns green.

1 Dec. 1989 Drinking water intake from Dutch Meuse stopped after discharge of camphorated sulphonic acid in Venlo.

9 Jan. 1990 Newspapers report that 40km of Meuse has turned 'luminous' after accidental discharge of limestone dust.

6 Feb. 1990 Shut-down of one reactor unit at Tihange; elevated radioactivity levels in Meuse.

29 June 1990 Massive pollution of Vesdre, Ourthe and Belgian Meuse, killing thousands of fish which pile up behind a dam near Liège. The dead fish cover an area 5 metres wide and almost 100 metres long. Probable cause: lack of oxygen and extreme levels of cadmium and zinc (60 and 100µg/l, respectively).

of the government Environmental Health Council.

At Tihange, 30km upstream from Liège, the Belgian nuclear industry operates three reactors, generating 2800 megawatts of electrical power — 40 per cent of the country's nuclear capacity. In recent reports, the nearby town of Andenne was named as a possible site for a new European fast breeder reactor. The reactors at Tihange appear to be among the least safe in Europe, with accidents and emergency shut-downs occurring frequently (*see* Box 1). Besides the Meuse, the Rur, one of its major tributaries, also receives effluent from nuclear plants. In Jülich, on the West German Rur, there is a major nuclear testing centre, with two prototype reactors, waste storage facilities and other research and development facilities.

Despite the urgency of the situation, international agreements on Meuse water quality are no closer to being achieved than they were 20 years ago. Besides the vested interests of industries and bureaucracies, the perennial tensions between the Flemish and Walloon regions of Belgium make the international negotiating process tedious and complex. In the aftermath of the 1990 ministerial North Sea Conference, where pledges were made to reduce some types of river pollution by 50 per cent by the end of the century, there are still no signs of concrete action for the

Meuse basin or even of plans to relieve the pressure on ecosystems and human health.

Air Pollution

Lying in the heart of industrialized northwest Europe, the Euregio suffers from chronic air pollution, covering the full range of industrial and agricultural pollutants. Hundreds of different gases and aerosols are discharged by industry, air and road traffic and power stations. Many of these are extremely toxic to human and ecological health and can accumulate in food chains. Industrial discharges of several organic chemicals that have been shown to cause cancer and genetic defects (so-called 'black list' chemicals earmarked by the European Commission for 'high priority' measures in the mid-1970s) are far higher in Limburg than anywhere else in the Netherlands (*see* Box 2).

Within the Netherlands, Limburg and the neighbouring province of North Brabant suffer from the country's highest levels of sulphur and nitrogen dioxide, fluoride and cadmium. [9] Within Belgium and West Germany, too, the Euregio borderlands suffer worst.[10] With a steady wind from the east, Central European emissions often aggravate the situation still further. Smog is a recurring event. There are three main types of sources (*see* Map 2):

- The multitude of chemical plants, steelworks and power stations situated in Liège, the Flanders borderland, the Aachen region, Dutch Limburg and along the Rhine and Ruhr;
- Road and air traffic from the high density of motorways and other major roads as well as from civilian and military airfields;
- The enormous concentration of intensive factory farming on the west bank of the Dutch Meuse.

In the Limburg borderlands, the acidity (pH) of the rain averages between 4.2 and 4.5, with frequent peaks of 3.8 to 3.9 ('natural' rain is about 5.6) — levels even higher than those affecting Germany's Black Forest. In the north of Limburg and North Brabant, the pollution burden affecting woodlands and other ecosystems is exacerbated by the enormous quantity of ammonia produced by the manure from the region's vast concentration of factory farms. In this part of the region, overall acid deposition is officially calculated to be 5-10 times the maximum that the ecosystem can tolerate.[11]

In 1985, a national survey of forest die-back showed that for the Netherlands as a whole, 35 per cent of trees were damaged and 15 per cent dying or dead. For the region described, these figures were 40 per cent and 30 per cent respectively. A more detailed survey, however, subsequently revealed that a far higher percentage of trees was damaged; 70 per cent as compared with 40 per cent in the original survey, with only 3 per cent of trees in a healthy condition. Although conifers were the first trees affected, it is now broadleaved species that are suffering the worst die-back. Between 1984 and 1988 (the last year for which data are available), the percentage of Dutch oak trees that were dying or near-dead increased from 5 to 40; today, only 20 per cent are healthy. For beech, the increase has been from 5 to 40 per cent, with 28 per cent healthy in 1988.[12] Nonetheless, even the Dutch Government's widely reported "tough environmental policy package" (*see* Nigel Harle, 'The Dutch Political and Environmental Crisis', *The Ecologist*, Vol. 19, No. 4) envisages saving no more than 20 per cent of the country's forest and woodland. [13]

Smog and Air Pollution Emergencies

It is not merely the quantities of toxic air pollutants that give cause for concern. Due to several geographical factors, the Euregio — and the Meuse valley in particular — often suffer weather conditions that intensify the effects of air pollution. Firstly, the west of the region is marked roughly by a transition from a maritime to a land climate, and the inhabitants of the Euregio are used to long periods with little or no wind and high humidity, both in warm summers and cold winters. Exacerbating the problem, especially in the early months of the year, are common temperature inversions, a phenomenon for which the Meuse valley is renowned, meriting specific mention in the international literature.

Under inversion conditions, with air pollutants trapped beneath a layer of warmer air, the effects of smog may become particularly serious. In mid-January 1987, for instance, a large part of continental Europe was enveloped in heavy smog. Sulphur dioxide (SO_2) levels in Limburg rose above the 'emergency level' of 830 micrograms per cubic metre ($\mu g/m^3$) in several places. Nitrogen dioxide (NO_2) levels also rose, due to traffic and industry, especially in the south of the province. On January 21st, a smog alarm was officially declared for the south, followed the next day by an alarm for the whole province. The levels of NO_2 rose dramatically on the 21st, varying from 200-250$\mu g/m^3$ at a rural monitoring point to around 500$\mu g/m^3$ along busy roads in rush-hour traffic. Although people were 'kindly requested' to leave their cars at home and take the bus and train, virtually nobody did so. Those suffering from respiratory and coronary complaints, meanwhile, were advised to stay indoors. Only at the end of the week, when the situation was already critical, did the authorities tell power stations and industry to switch to burning gas instead of coal where possible.

In itself, a smog period such as this is unhealthy enough. Under the conditions of an inversion, however, it is potentially catastrophic. Because pollutants are trapped under a warmer layer of air, a major accident at a chemical or nuclear plant would almost certainly have disastrous consequences.

Nuclear Power

The Euregio is surrounded by nuclear power plants. Within a radius of 165kms from its centre, the distance to which initial evacuation procedures in the USSR were extended following the Chernobyl disaster, there are no less than 18 operational reactors, with several more planned for the coming years. These pose two main dangers to the region's population; continual pollution of air, water and food by routine discharges and seepage from waste, and the hazard of a major accident.

To an extent, the potential health consequences of the Chernobyl accident were restricted by the relatively small size of the local population. In the densely populated heart of Western Europe, however, a full-scale nuclear emergency would involve many more casualties and affect the health of many millions of others for generations to come. Evacuation of the population at risk would be a virtually impossible task, even if such procedures were started on time. Were the area's chemical plants to be affected, the problems would be even worse.

The national borders dissecting the Euregio make a nonsense of evacuation plans. The three Belgian nuclear reactors at Tihange are 40kms from the border of Dutch Limburg, and thus beyond the bounds covered by post-Chernobyl agreements on

Box 2: Limburg's Disproportionate Share of the Netherland's Pollution

[Limburg covers an area of 6 per cent of the Netherlands]

Chemical	Approximate emission (tonnes per year)		Limburg's Share of Pollution
	Netherlands	Limburg	
Acrylonitrile	235	175	75 %
Ethylene	3,000	600	20 %
Phenol	195	155	80 %
Fluorides	1,300	240	18 %
Formaldehyde	165	40	24 %
1,2-dichloroethane	365	90	25 %
Tetrachloromethane	475	145	31 %

Source: *Milieunota*, Limburg provincial authorities, 1985; *Milieu Aktie Plan DSM*, 1985

transboundary emergency planning. Were a nuclear reactor accident to occur, Intercom, the plant operators, would have to telephone the Liège provincial authorities, who in turn would have to contact the Ministry of Internal Affairs in Brussels, which would then (though this is not obligatory) alert the Foreign Ministry, which would finally contact the Hague. And so, by way of a 'detour' of 400km, the message would finally be passed on to the provincial authorities of Dutch Limburg, which would then start evacuating the population. Only in 1989 did the Dutch authorities install a radiation monitoring station in Limburg.

Even without a full-scale disaster the nuclear reactors and waste facilities pose a serious hazard. Tritium pollution — a unique form of contamination affecting the water molecule itself (radioactive tritium, with an atomic weight of three, replacing stable hydrogen, with an atomic weight of one) — is not the only worry. Nuclear power plants and research facilities are also permitted to discharge particles of radioactive metals into waterways (particularly isotopes of caesium, cobalt, and manganese). Meanwhile, near-continuous emissions of radioactive gases such as krypton, xenon, carbon dioxide and methane, are permitted on the familiar argument that high stacks will dilute the pollutants to 'safe levels'. Acid rain has shown us how false such arguments are. Nuclear power plants also cause other, non-nuclear pollution. In times of low river flow, the waste heat pumped into the Meuse causes ecological disruption, and the chlorine and sulphates used to keep the discharge pipes free of algae have killed huge numbers of fish.

The Contamination of Water Resources

In many areas of the Euregio, groundwaters, from which the region obtains the bulk of its drinking water, are seriously contaminated. In some cases, point-source industrial dumps have necessitated the closure of wells. However, the major problem today is pollution of the groundwater with sulphates and nitrates. The sulphate problem is mainly a legacy from a century of coal mining. The enormous slag heaps and mining sludge (an estimated 200 million tonnes in South Limburg alone) contain iron pyrites which once above ground are oxidized to sulphate. This salt is carried down to the water table by rainwater; the more acid the precipitation, the faster the rate of sulphate formation. Springs downstream of slag heaps contain 1000-3000 milligrams per litre (mg/l) of sulphate — up to 120 times the European Commission's recommended safe level of 25mg/l. [14]

The high nitrate levels in the groundwater constitute one of the region's most pressing problems. They are due mainly to intensive farming practices and are aggravated by airborne deposition. In the Netherlands, an average of 25 tonnes of nitrate (both chemical fertilizer and manure) are applied each square kilometre of farmland, the most intensive application rate in the world — twice that of the US, the country with the next highest loading.[15]

Over the last ten years, the nitrate levels in groundwater used for drinking have risen above the 'recommended' European Community value of 25mg/l, with some sources exceeding the maximum permissible concentration (MPC) of 50mg/l. Virtually all sources exceed 10mg/l, the level considered safe for babies — and the legal maximum in Norway. The nitrate problem is particularly serious in the south of the region, in the unconfined aquifers of the loess district, and in the sandy north, where groundwater resources consist of one or two shallow layers only. In the latter area, almost half the sources contain levels above 25mg/l.[16]

In March 1990, the Limburg district health authorities advised people with private wells, anywhere in the province, to stop using them and to connect to the mains instead. Consumer organizations recently warned against drinking soft drinks manufactured in the south of the province, where water sources contain 25mg/l of nitrate.[17] In Belgium, environmental groups have found levels of 50mg/l in several brands of beer from north Flanders. [18]

Even if intensive farming practices were discontinued immediately, the nitrates already present in the soil would still continue to percolate down to the water table. By the year 2000, all groundwater resources in south Limburg are expected to have nitrate levels above the MPC of 50mg/l, with the majority of others throughout the Euregio above the recommended limit. For a large part of the next century, levels will continue to rise still further.

The nitrate problem has been public knowledge for years — it was disclosed recently that Dutch agriculture ministers have, since the late 1960s, ignored repeated warnings from their own ministry of the environmental effects of the country's growing manure surpluses — and yet no measures were ever taken to avert lasting pollution of groundwater. Although the nitrate issue is now at the forefront of public attention, the parallel long-term leaching of non-degradable pesticides through the soil may pose a far graver problem in years ahead. In 1988, the Dutch water authorities conducted a survey among 60 of the country's water supply companies; of the 50 that responded, only 41 monitored for pesticides and, of these, 66 per cent had detected one or more pesticide in at least one of their wells. Forty-six per cent of the companies reported levels above the MPC of 0.1mg/l. [19]

Coal Mining

The coal mines stretching from Aachen in West Germany, through South Limburg and on to the Belgian Kempen district were brought into production around the turn of the century, and later formed the focus around which chemical plants were to be built. Most of the mines have now been closed down, leaving a legacy of slag heaps and disturbed regional hydrology. The Dutch mines alone — most of them formerly operated by DSM — cover 1500 hectares at 120 locations, figures comparable to the quantities dumped at the Belgian and German mines. From these waste tips, a variety of pollutants (including sulphate, chloride and a group of tar-like chemicals known as polycyclic

aromatic hydrocarbons) have, for decades, been leaching out to contaminate surface and groundwater resources.

Some slag heaps — for instance in the Heerlen/Kerkrade conurbation — have been 'landscaped' into housing estates. On one of these, residents are fighting the housing association in court, following a marked increase in the number of stillborn babies born locally. Those who have moved into the area complain of headaches, skin rashes, nausea and other disorders. Levels of benz(a)pyrene in the gardens of one housing estate were 20-250 times the government's 'acceptable' level.

In the German mines, the hydraulic fluids used in mine pumps contain PCBs, which have so contaminated the water of the River Rur that eels are no longer fit for human consumption. A few years ago, the PCBs were replaced by Ugilec, supposedly an 'environmentally friendlier' option. Since then, it has transpired that Ugilec is just as toxic as PCB and is also accumulating in sludge and fish.[20]

Lignite

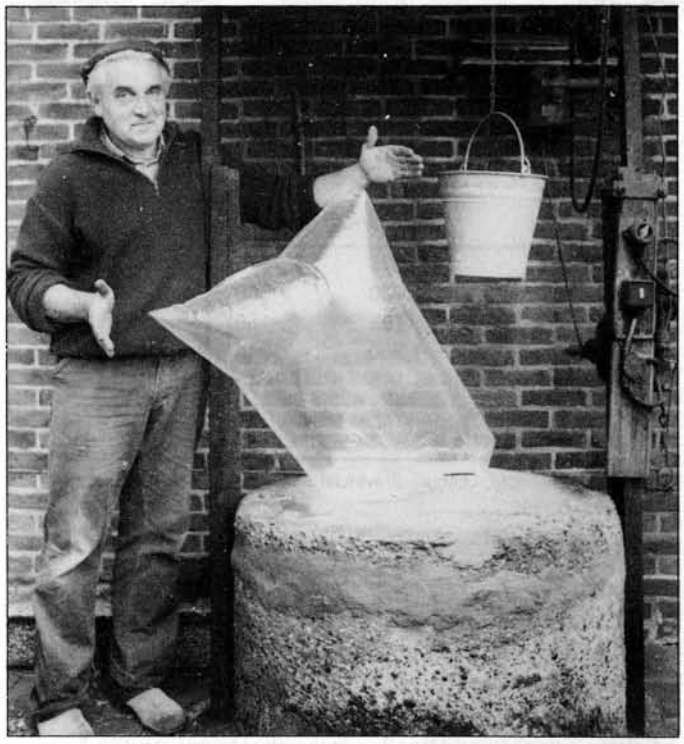
The lignite mines of the West German border region are the largest open-cast mining operations in Western Europe. Situated between Aachen, Cologne and Mönchen-Gladbach, five mines currently produce 120 million tonnes of burnable fuel a year, much of it for the power stations that supply the Rhine/Ruhr area with electricity. Rheinbraun AG, which operates the excavations as part of a wide range of industrial and mining activities, is the largest single employer in North Rhine Westphalia.

The mining operations are on a scale usually reserved for Third World countries. The largest of the excavations, Hambach I, covers an area of 8500 hectares (85 square kilometres) and is 160 metres deep. Beside it, the earth removed with the lignite has been piled up in a man-made hill 200 metres high and covering an area of 1000 hectares. In some pits, the exploitable brown coal extends down to a depth of 300 metres. The earth is dug up by giant excavators, among them the biggest moving machine in the world; 225 metres long, 44 metres wide and 96 metres high. It can dig up 240,000 cubic metres of the Earth per day. To date, about 250 square kilometres of land has been destroyed, useable fuel being burnt (the lignite-fueled power stations in the German borderlands emit about 350,000 tonnes of sulphur dioxide a year) and the rest being dumped in heaps, and sometimes planted with trees for 'landscape enhancement'. Already, an area of about 250 square kilometres has been excavated, and 30,000 people from dozens of villages have been forced to leave their land and resettle in other areas.[21]

To keep the pits dry for mining operations, some 1.2 billion cubic metres of ground water are pumped away per year — more than the amount used each year by the entire Netherlands' population. This groundwater has supplied the region with drinking water for centuries, but the water table is now falling at an alarming rate. Nature reserves and other areas 50kms away over the Dutch border are drying out, and drinking water authorities are extremely worried about future supplies.

The Future

Reading this survey of ecological rack and ruin in the heart of 'civilized' Europe, the reader will rightly wonder what steps are being taken to arrest these catastrophic developments. In one area, agriculture, steps are indeed being taken to reduce further



A farmer in Dutch Limburg inflates a plastic bag with vapour given off by the benzene in his well. Groundwater contamination near industrial dumps has led to the closure of many wells in the Euregio. (Photo: Peter Schols)

nitrogen inputs to the soil. In the very vulnerable south of Limburg, the import of manure surpluses from other regions has now been banned. However, these measures will still not influence groundwater contamination until sometime in the middle of next century. Moreover, any proposals for common sense action to break away from the environmentally devastating cycle of high-intensity factory farming and agrochemical fodder monocultures — such as reducing the astonishing number of farm animals — are still taboo for Dutch policy-makers.

Indeed, for the vast majority of problems affecting the region, the signs are that the situation will rapidly deteriorate in the years ahead, outpacing all 'end-of-the-pipe' measures being proposed by those in power. In the Netherlands and Germany, governmental 'environmental control' policies have been denounced by environmental groups, doctors and others as wholly inadequate. To all intents and purposes, Belgium simply has no policies.

Future trends are likely to be shaped by the move towards a Single European Market in 1992. A new era of industrial expansion is underway in the region. Of all the foreign industries that set up operations in the Netherlands in 1989, half came to South Limburg.[22] Similar efforts are being made in bordering Flanders. It is not only Japanese, US and other foreign firms that are in involved; the Belgian company Vieille Montagne has announced new plans to become "the world's largest cadmium producer" at its plant at Overpelt along the north Belgian border.

At the end of 1989, ministers from the three Benelux countries signed a declaration to "undertake new joint efforts to develop the Euregio-area".[23] One month later, the mayors of the major seats of regional government in Aachen, Liège, Hasselt (near Genk), Maastricht and Heerlen agreed to work more closely, to the same basic ends.[24]

The disappearance of the borders in 1992 will mean a drastic upscaling of regional planning. One consequence is that the relatively poor farming areas along the western border of North Rhine Westphalia will suddenly acquire 'suburb potential' for

the string of congested Dutch towns on the other side of the border. In the German Selfkant district, near Dutch Sittard, local authorities are now pushing for new roads, housing estates and recreation areas, and other districts are sure to follow.

The scale of economic expansion involved in creating the 'New Europe' is reflected in the new generation of mega-motorway links being planned across the continent by the so-called European Roundtable of Industrialists, representing 43 of Western Europe's major corporations. Among the road-building and civil engineering projects envisaged by this scheme — termed 'Missing Links' — are the controversial Scandinavian 'Scanlink' project and the Channel Tunnel. The north of Belgium, the west of Germany and the whole of the Netherlands are seen as the fulcrum of the project.[25]

The Euregio is also scheduled to become a major 'waste management' centre serving a large part of northwest Europe. In August 1989, the Belgian nuclear authority, Niras, declared the disused coal mines at Beringen and Zolder, between Genk and the Mol nuclear centre, fit for dumping 'low-level' radioactive waste.[26] On the Belgian-Dutch border near Maastricht, two new waste incineration plants are under construction. One, in Lanaken, is for domestic refuse, while the second, in Herstal, is for incinerating chemical waste. Near Genk, in Belgium, a major chemical waste 'processing' centre is planned, comprising incinerators and other installations. In Dutch Limburg, too, the province's major industries have announced plans to build a large-scale incinerator for their chemical waste; the provincial authorities plan to construct another incinerator, near Roermond, for domestic refuse and for sludge from water treatment plants (500,000 and 265,000 tonnes a year, respectively). On the German side of the North Limburg border, near the village of Weeze-Wemb, the German government is planning to open the largest dump site in Europe, to be used for both chemical and domestic waste. The 160 hectare dumping site will be able to hold 15 million cubic metres of waste. Despite strong protests, the authorities have still not yet answered any questions on the environmental risks of the project. Plans were also announced last year for five other 'open-cast' chemical tips in the region, in addition to two domestic waste incinerators and no less than six chemical waste incinerators (with a throughput of 150-200,000 tonnes a year). This in an area that has already suffered a disproportionate share of the price of development — even by Euregio standards. The Jülich region already has the worst air pollution levels in West Germany and both the post-natal death rate and the number of children with respiratory disorders is far higher in the Düren area than the national average.[27] The developments are being opposed by environmental groups, as well as concerned pediatricians and family doctors.

Conclusions

Current development models are approaching their nadir in regions like the Euregio. Those who charge environmentalists with wanting to return to the dark ages must face the fact that if we continue along the present path of ecological destruction, we will be returning to the dark ages whether we like it or not.

The argument that we cannot change our industrial base is nonsense. Since the limits to growth were identified almost 20 years ago, countless 'alternative scenarios' have been developed by organizations, institutes, political parties and individuals. These scenarios have demonstrated that we can run an economy based on environmental compatibility and social justice, providing food and other requirements for the people of the world without destroying the planet. Today, the urgency of implementing such an economy is greater than ever, and with it the need to radically reassess some of the central premises of the modern concept of development. Unbelievably, however, an increasingly unaccountable technocratic establishment is now surging forward — in the fora around 'Europe 1992' and GATT for instance — with plans that in their implications are not only totalitarian but, ultimately, disastrous.

"During smog periods, warnings are issued to those at risk to stay indoors — effectively asking a quarter of the population to shut themselves up for periods of a week or more."

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Free Trade:
The Great Destroyer
by
David Morris

Free trade is the religion of our age, less an economic strategy than a moral dogma. In its name, every nation has now become enmeshed in a planetary economy in which the transport of capital, materials, goods and people takes precedence over the autonomy, the sovereignty and, ultimately, the culture, of our communities.

The planetary economy merges nations. Yoshitaka Sajima, vice-president of Mitsui and Company (USA), asserts: "The US and Japan are not just trading with each other anymore — they've become part of each other." The US and Canadian governments have signed a free trade agreement to merge the two countries. One of the key provisions in the treaty is Canada's agreement to allow foreign ownership of its productive assets. Northern Mexico is all but integrated into the US economy through the tremendous growth of the 'maquiladoras' — factories that use US-made intermediary products and raw materials to manufacture or assemble final products for re-export into the US. By the turn of the century, the industrial heartland of North America may be on the other side of the Texan and New Mexican border. Meanwhile, in Europe, the Common Market has grown from six countries in the 1950s, to ten in the 1970s, to twelve today, and barriers between these nations are rapidly being abolished. Pressure is now on the fiercely independent Scandinavian countries to join. Increasingly there are no Italian or French or German companies but only European supra-corporations.

Export promotion is now widely accepted as the foundation for successful economic development — witness the success of the newly-industrializing countries like South Korea and Taiwan and Singapore (see Walden Bello and Stephanie Rosenfeld, 'Environmental Devastation in Taiwan', *The Ecologist*, Vol 20, No 4, 1990). Whether by a tiny country like Singapore or a huge country like the United States, ever-growing exports are viewed as essential to the nation's economic health. In Minnesota, the former Department of Energy and Economic Development has become the Department of Trade and Economic Development. The energy division has moved to another agency. The change is revealing for two reasons. The energy programme's main goal was to reduce Minnesota's reliance on imported energy, to promote self-reliance by tapping into local resources and encouraging higher efficiency. Today, the Department's principal goal is to make Minnesota more dependent on the rest of the world.

Planetism commands our attention and our resources. The principal tasks before our leaders, we are told, is to nurture, extend and manage emerging global systems. The West, led by the US, is now on the brink of war in the Persian Gulf in order to protect oil pipelines, even while these very nations cut back of programmes intended to make them less dependent on Arab oil. Trade talks are on the top of every leaders agenda, from Gorbachev to Bush. Political leaders meet to develop stable systems for global financial markets and exchange rates to allow the greatest flow of resources among nations with the least instability.

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Destroying Communities

Free trade demands that we treat our neighbours no differently than we treat distant peoples with different customs, language and culture. Planetism rearranges our loyalties and loosens our neighbourly ties. As the *New York Times* puts it, "The new order eschews loyalty to workers, products, corporate structure, businesses, factories, communities, even the nation." Martin S. Davis, chairman of Gulf and Western, goes further, "All such allegiances are viewed as expendable under the new rules. You cannot be emotionally bound to any particular asset." We are now assets.

Jettisoning loyalties is not easy. But that is the price we pay to receive the material benefits of the 'global village'. Every community must achieve the lowest possible production cost even when that means companies breaking whatever remains of their social contract with communities. Stanley J. Mihelick, executive vice-president for production at Goodyear is explicit, "Until we get real wage levels down much closer to those of the Brazils and Koreas, we cannot pass along productivity gains to wages and still be competitive." Wage rises, environmental protection, national health insurance, liability lawsuits, anything that raises the cost of production makes us more uncompetitive and threatens our economy.

Never before have we so nakedly and publicly expressed the need for the planetary economy to destroy local cultures. More and more human relationships have been transformed into commercial transactions. We have moved from diversified to specialized economies — separating the producer from the consumer, the farmer from the kitchen, the power plant from the appliance, the dump site from the dustbin, the banker from the borrower and depositor and, inevitably, the government from the citizenry. Development becomes a process by which we separate authority and responsibility, where those who make the decisions are not those effected by the decisions. Moreover, the planetary economy demands planetary institutions. Just as *Homo sapiens* is assumed to be nature's highest achievement so the supranational corporation becomes our most highly evolved economic animal.

The Doctrine Falters

Yet at this very moment in history when the doctrines of free trade and globalism are so dominant, we find more and more people raising doubts. Two hundred years ago, Benjamin Franklin warned: "The man who would trade independence for security deserves to wind up with neither." Wilfully and consciously, we have made that trade.

The absurdities of globalism are becoming ever more evident. Consider the case of the toothpick and the chopstick. A few years ago, I was eating at a restaurant in Saint Paul, Minnesota. After lunch, I picked up a toothpick wrapped in plastic. On the plastic was the word 'Japan'. Now Japan has little wood and no oil. Yet in our global economy, it is deemed efficient to send little pieces of wood and some barrels of oil to Japan, wrap the one in the other and send them back to Minnesota. This toothpick may embody 50,000 miles of travel. Meanwhile, in 1987, a Minnesota factory began producing millions of disposable chopsticks a year for sale in Japan. In my mind's eye, I see two ships passing one another in the northern Pacific. One carries little pieces of Minnesota wood bound for Japan; the other carries little pieces of wood from Japan bound for Minnesota. Such is the logic of free trade.

Two centuries of trade has not evened up disparities in world living standards but exacerbated them. According to Swiss economist Paul Bairoch, per capita GNP in 1750 was approximately the same in the developed countries as in the undeveloped ones. In 1930, the ratio was about 4 to 1 in favour of the developed. Today it is 8 to 1.

Consider the plight of the Third World. Developing nations borrowed enormous sums of money to create the infrastructure to specialize in what they do best and to expand their export capacity. To repay the loans, these countries had to increase their exports even more to earn internationally acceptable currencies. One result has been a dramatic shift in their agricultural resources from producing food for internal consumption to producing food for export. Economists point to increased exports of wheat and soybeans from the developing world as evidence of their progress. But take the case of Brazil. Brazilian per capita production of basic foodstuffs (rice, black beans, manioc and potatoes) fell 13 per cent from 1977 to 1984. Per capita output of exportable foodstuffs (soybeans, oranges, cotton, peanuts and tobacco) jumped 15 per cent. Today some 50 per cent of Brazil suffers malnutrition. Yet one leading Brazilian agronomist still calls export promotion, "a matter of national survival". In the global village, a nation survives by starving its people.

Even in the United States, the most developed of all nations, free trade has not prevented living standards from declining over the last 15 years. Americans work almost half a day longer today for lower real wages than in 1970. Less leisure time, less time with the family and community. If the present trend continues, we may have less leisure time in the 1990s than we had in the 1970s.

Rethinking Values

Clearly, it is time to re-examine the doctrine of free trade and its corollary, the planetary economy. We can begin by discussing values. Albert Einstein once noted, "Perfection of means and confusion of ends seems to characterize our age". Fifteen years ago, the New York Village Voice dubbed our generation, 'Consumers of change'. But we should not confuse change with progress. Bertrand Russell described change as 'inevitable' and progress as 'problematic'. We must decide what values we hold most dear and then design an economic system that reinforces those values.

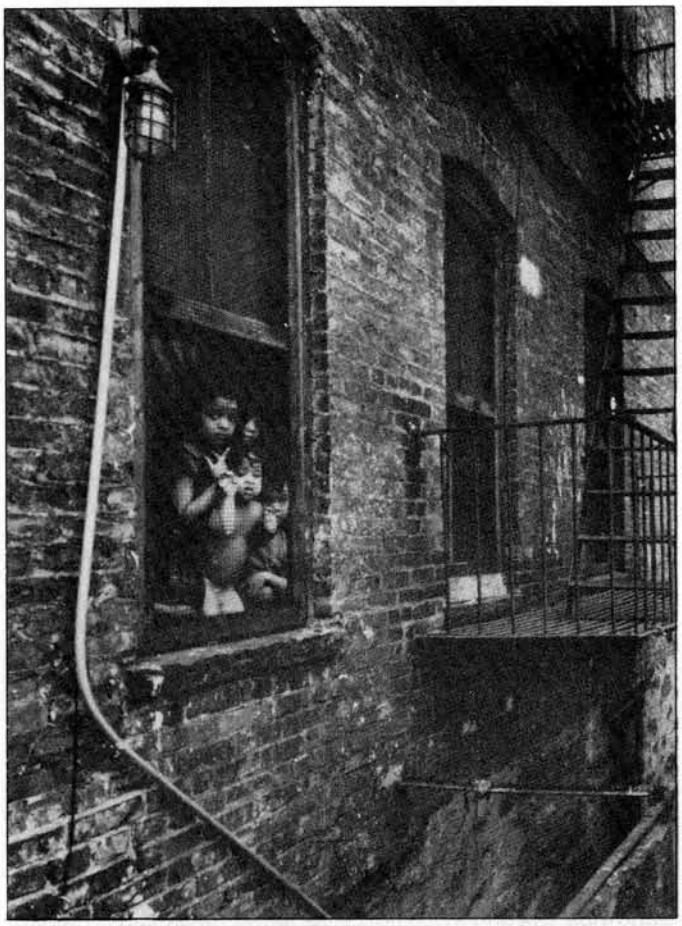
Free trade has made the same consumer goods available worldwide. But only at the cost of local self-reliance. The control of resources and markets is now increasingly in the hands of governments and multinational corporations. Two hundred years ago, Benjamin Franklin warned: "The man who would trade independence for security deserves to wind up with neither." Wilfully and consciously, we have made that trade.

Price and Cost

For advocates of free trade, competition is both necessary and healthy, spurring innovation, raising productivity and above all lowering prices. The more competition, the better. The consumer is held to be 'king', ultimately deciding which product and company survives in a vigorous and unregulated marketplace.

If price is to be our guide for buying, selling and investing, then price should tell us something about efficiency. Efficiency should refer to the amount of real resources used per amount of useful product manufactured. We might measure efficiency in natural resource terms, that is, by measuring the amount of waste produced in converting a raw material into a consumer or industrial product. Or we might measure efficiency in human terms, that is, by measuring the amount of hours it takes for a person to make a product.

In the 18th and 19th centuries most advocates of free trade used labour efficiency as their criteria. Adam Smith announced, "Labour alone, therefore, never varying in its own value, is alone the ultimate and real standard by which the



"In the 1950s and 1960s, inner city neighbourhoods were levelled to rebuild city centres. Then sociologists and economists and planners found that the seedy areas we had destroyed were not fragmented, violent slums but cohesive ethnic communities. If we had used a full cost accounting system, we never would have undertaken urban renewal."

value of all commodities can at all times and places be estimated and compared. It is their real price; money is their nominal price only."

Political leaders of the last century also defined efficiency in this manner. In 1861, Abraham Lincoln asked rhetorically, "(Should) duties on imports . . . be adjusted to favour home production in the home market?". He answered, "I have long thought it would be to our advantage to produce any necessary article at home which can be made of as good quality and with as little labour at home as abroad at least by the difference of the carrying from abroad . . . all labour done . . . in carrying articles to the place of consumption, which could have been produced in sufficient abundance, with as little labour, at the place of consumption as at the place they were carried from, is useless labour."

It is true that when these people wrote wage earners had yet to organize for better working conditions or wages. Wage differences between workforces in developed and underdeveloped nations were small, while transportation costs were high. Under those circumstances, the differences between evaluating efficiency on wage rates or on productivity may have been insubstantial. But, today, wage rate inequalities among comparably skilled workforces can be as great as 30 to 1. This disparity overwhelms even the most productive worker. An American worker might produce twice as much per hour as a Mexican worker but is paid ten times as much. Today, price is the central and often the only criteria used for evaluating "allocative efficiency".

But price is no measure of efficiency. In fact price is arguably no reliable measure of anything. The prices of raw materials, labour, capital, transportation and waste disposal are all heavily subsidized. In Taiwan, for example, strikes are illegal. In South Korea, until recently, unions could not be organized without government permission. To all intents and purposes, South Africa uses slave labour. Many developing nations have no maximum hours, minimum wage or environmental legislation. As the American economist Howard Wachtel notes:

> "Differences in product cost . . . that are due to totalitarian political institutions or restrictions on economic rights reflect no natural or entrepreneurial advantage . . . Free trade has nothing to do with incomparable political-economic institutions that protect individual rights in one country and deny them in another."

Goods from developed nations may carry a higher price because their workers are paid a decent wage. But their prices are usually lower than they would otherwise be because of other kinds of subsidies. For example, we build interstate highways and levy taxes on heavy trucks that do not cover the damage done to the roads by their passage. We provide water to California farms at public expense, charging farmers as little as five per cent of the going market-rate of water, and give huge direct subsidies to corporate farmers. We allow the costs of agricultural pollution to be picked up by society as a whole. And then we are told that it is cheaper to grow a tomato in California and ship it to Massachusetts because of California's climatic advantages. If we withdrew all the subsidies, it might very well be cheaper to raise produce near the point of sale.

Indeed, across the economy, there is an enormous disparity between the price of a product or service to an individual and the cost of that same product or service to the society as a whole. In the 1950s and 1960s, for example, we levelled inner city neighbourhoods to assemble sufficient land area to rebuild city centres. Skyscrapers and shopping centres arose, the property tax base expanded and we considered it a job well done. And then sociologists and economists and planners found that the seedy areas we had destroyed were not fragmented, violent slums but cohesive ethnic communities where generations had grown up and worked, where families went to school and played. If we were to put a dollar figure on the destroyed homes, broken lives, relocation and the recreation of community life, we might find that the city as a whole actually lost money in the urban renewal process. If we had used a full cost accounting system, we never would have undertaken urban renewal.

It is not only urban areas that have suffered from our refusal to understand and count the social costs of certain kinds of development. In 1944, Walter Goldschmidt, working under contract with the Department of Agriculture, compared the economic and social characteristics of two rural California communities that were alike in most respects except one. Dinuba was surrounded by family farms; Arvin by agribusiness corporations. Goldschmidt found that Dinuba was more stable, had a higher standard of living, more small businesses, higher retail sales, better schools and other community facilities and a higher degree of citizen participation in local affairs. The USDA invoked a clause in his contract forbidding him to discuss his findings. The study was not made public for almost 30 years. Meanwhile the USDA continued to promote research that rapidly transformed the Dinubas of our country into Arvins.

In most cases, we can protect our way of life, achieve important social and economic goals, without the price of goods and services rising significantly. In some cases, we must pay more, but then the higher prices may be offset by the decline in overall costs. Consider the current legislation to 'Save the Family Farm', legislation which proposes that farmers limit production nationwide in return for the nation setting a price sufficient to cover operating and capital costs and provide an adequate living. The law's sponsors estimate such a programme would not increase the cost of agricultural products in the stores by more than a few cents. But this would be more than offset by dramatically reduced public expenditures in traditional farm programmes. And this does not take into consideration the social benefits of a stable rural America, which would include a reduction in the incidence of family violence and in the influx of jobless rural emigrants into already suffering urban areas, and hence a reduction in expenditures for medical bills, food stamps and welfare.

The Need for Community

Many of the chief architects and proponents of free trade took pains to emphasize the need for community. That they did not emphasize this more was perhaps because they saw no reason to belabour the obvious. That we would bankrupt our neighbours to save a few pennies would have seemed inconceivable to them.

Listen to Adam Smith. "Upon equal or nearly equal profits, therefore, every individual naturally inclines to employ his capital in the manner in which it is likely to afford the greatest support to domestic industry, and to give revenue and employment to the greatest number of people of his own country."

Listen to David Ricardo. "Feelings, which I should be sorry to see weakened, induce most men to be satisfied with a low rate of profits in their own country, rather than seek a more advantageous employment for their wealth in foreign countries." Imagine Ricardo's and Smith's reaction to the current penchant for foreign investments by state pension funds. The collective savings of the citizens of a state are increasingly being invested in industries that compete with those within that state.

And finally, listen to John Maynard Keynes, the architect of much of our global economy. In 1933 he confessed:

> "I was brought up, like most Englishmen, to respect free trade not only as an economic doctrine which a rational and instructed person could not doubt, but almost as a part of the moral law. I regarded ordinary departures from it as being at the same time an imbecility and an outrage . . . As lately as 1923, I was writing that free trade was based on fundamental truths which, stated with their due qualifications, no one can dispute who is capable of understanding the meaning of the words."

But then he saw the light:

> "The divorce between ownership and the real responsibility of management is serious within a country when, as a result of joint stock enterprise, ownership is broken up among innumerable individuals who buy their interest today and sell it tomorrow and lack altogether both knowledge and responsibility towards what they momentarily own. But when the same principle is applied internationally, it is, in times of stress, intolerable — I am irresponsible towards what I own and those who operate what I own are irresponsible toward me. There may be some financial calculation which shows it to be advantageous that my savings should be invested in whatever quarter of the habitable globe shows the greatest marginal efficiency of capital or the highest rate of interest. But experience is accumulating that remoteness between ownership and operation is an evil."

"The West, led by the US, is now on the brink of war in the Persian Gulf in order to protect oil pipelines, even while these very nations cut back of programmes intended to make them less dependent on Arab oil. "

All these eminent economists embraced the need for community neighbourliness, patriotism, sovereignty, ownership as values integral to any investment decision. Values important enough to outweigh the modest efficiency improvements that come with free trade in its purist form.

Keynes, writing in the decade when the international system broke down, knew how the planetary economy magnified the catastrophic impact of a reduction in trade. Today, we have resumed the path of interdependence with a vengeance. In 1970, if world trade had collapsed the impact on the United States would have been modest. Today, if we should be cut off from imports we would suffer severe harm. Ten years from now, if present trends continue, even a country as large and potentially self-reliant as the US, might not be able to survive in any civilized form a breakdown in international relations.

Trading independence for security looks increasingly like a bad deal. Economic development demands increased trade but increased trade demands more dependence. As the nations of the earth bind together their economies, the harmful impacts of a breakdown in the trading system become magnified, until finally planetary trade becomes essential for the very survival of our societies. One might, I suppose, argue that this very interweaving makes such breakdowns less and less likely, for no country would undertake to break away knowing that it would suffer as a result. Assuming that such rationality will dominate policymakers in a world rife with religious wars and massive inequality is a dubious proposition.

Comparative Advantage

If price is no real guide to costs and efficiency, the second main pillar of free trade — the law of of comparative advantage — is also questionable. There are two kinds of comparative advantage: absolute and relative. Absolute comparative advantage is the easiest to understand. Differences in climate and natural resources suggests that Guatemala can do some things better than Minnesota and vice versa. Guatemala should raise bananas and Minnesota should raise Walleye pike.

Relative comparative advantage is a somewhat less intuitive, but ultimately much more powerful, concept. As David Ricardo, a principle architect of the doctrine of the free trade movement, explained:

> "Two men can both make shoes and hats and one is superior to the other in both employments; but in

making hats he can only exceed his competitor by one fifth or 20 per cent, and in making shoes he can exceed him by one third or 33 per cent — will it not be for the interest of both that the superior man should employ himself exclusively in making shoes and the inferior man in making hats?"

Thus even if one community can make every product more efficiently than another, it should specialize only in those items that it produces most efficiently in relative terms and trade for the others. Each community, and ultimately each nation, should specialize in what it does best.

Yet, in an age of increasing mechanization, the theory of comparative advantage is fast losing its credibility. Even a half century ago, Keynes could comment, "A considerable degree of international specialization is necessary in a rational world in all cases where it is dictated by wide differences of climate, natural resources, native aptitudes, level of culture and density of population . . . (but) experience accumulates to prove that most modern processes of mass production can be performed in most countries and climates with almost equal efficiency."

Time was when technology spread slowly. In northern Italy, in the 17th century, stealing or disclosing the secrets of silk-spinning machinery was a crime punishable by death. At the height of the industrial revolution, Britain protected its supremacy in textile manufacturing through laws banning both exports of machines and emigration of men who knew how to build and run them. A young British apprentice, Samuel Slater, brought the industrial revolution to the US by memorizing the design of the spinning frame. Today technology transfer is simple. According to Dataquest, a market research firm, it takes only three weeks after a new US-made product is introduced before it is copied, manufactured and shipped back to the US from Asia.

Economies of Scale

According to advocates of free trade, bigger production units are necessary to keep the costs of production as low as possible. No one would or could deny that there are economies of scale. There is no question that when I move production out of my basement and into a factory, the cost per item produced declines dramatically. But when the factory multiplies output a 100-fold, production costs do not tend to decline much further. The vast majority of the cost decreases are captured at fairly modest production levels.

For farming, the USDA studied field crops and concluded, "Above about $40-50,000 in gross sales — the size that is at the bottom of the end of medium sized sales category — there are no greater efficiencies of scale." Another USDA report agreed, "Medium sized family farms are as efficient as the large farms."

In production, Harvard Professor Joseph Bain's pioneering investigations in the 1950s found the minimum efficient factory was often far smaller than the average plant. And the factory could be significantly reduced in size without suffering major price increases. In other words, we might be able to produce shoes for a region rather than for the nation at about the same price per shoe. And if we were to withdraw our subsidies to the transportation system, locally produced and marketed shoes might actually be cheaper than those brought in from abroad.

Today the trend may be toward smaller production plants. Almost 20 years ago, the economist John Blair noted the emerging 'knowledge intensive' industries which were leading to 'centrifugal' technologies. The mini float-glass plant is a good example. Traditional float-glass plants produce 500-600 tons of glass daily and cost $100 million to build. New mini plants can produce about 250 tons per day for $40-50 million, the same cost per ton.

In the electric power field, no sensible utility will build a huge power plant that can serve a million people, even though just 20 years ago experts were telling us that power plants had unlimited economies of scale. Today, small combined heat and power plants are almost three times as efficient as centralized power plants, because the waste heat can be usefully captured for nearby applications. They can also come on-line more quickly and therefore can more easily match changes in demand with changes in supply. This eliminates a basic weakness of large central plants which require 7-10 years to come on line, thereby demanding increasingly difficult to acquire accurate long range demand forecasts.

A Globe of Villages

Let me now explore the possibilities and strategies for a new kind of world economy, one whose metaphor would be a globe of villages, not a global village. This would be a planetary economy that emphasizes community and self-reliance. Such self-reliance would not be the same as self-sufficiency. As biologist Russell Anderson suggests, self-reliance is "the capacity for self-sufficiency, not self-sufficiency itself." It gives us the capacity to survive if cut off from suppliers by natural or man-made intervention. It encourages us to maintain a diversity of skills within our societies and to localize and regionalize productive assets. It is a strategy that welcomes 'foreign' capital, but not at the expense of local ownership; that promotes competition but also encourages co-operation; and that recognizes the value of the voluntary sector as a vital underpinning of civil society. It is a strategy that emphasizes prevention rather than treatment and that looks towards a society which promotes satisfaction rather than consumption.

Once dismissed as 'Utopian', the paradigm of a globe of villages is already beginning to help solve pressing national and local problems. Take that of waste. In the USA, pressure from local communities has led to the closure of many existing domestic waste dumps and a refusal to build new ones, with the result that the costs of waste disposal have rocketed over the past decade, rising faster and further than the cost of oil in the 1970s. Although rising disposal costs spawned many innovative techniques and technologies to solve the domestic waste problem, local and national officials continued to approach the problem with the analytical tools of the planetary economy. Defining waste as a disposal issue rather than as an economic development opportunity, they opted for the solution that demanded the least institutional or political change: incineration.

In doing so, they not only voted to continue — and perhaps even expand — the consumption of raw materials but they also chose a 'solution' that itself generates considerable quantities of waste for disposal — namely, a toxic incinerator ash equivalent to about 30 per cent by weight of the incoming waste. Inevitably, the dumping of such toxic ash has led to considerable local opposition, thus perpetuating the waste crisis. The travels of Philadelphia's incinerator ash barge may have re-

ceived less publicity than that of the rubbish barge from Islip, New York, but its case is just as exemplary. The barge was refused entry by five countries. For more than two years, it remained on the high seas.

Now consider an approach to waste that embraces the paradigm of a globe of villages — one that attempts to strengthen community by reducing imports and capturing the maximum value from local resources. One that emphasizes resource efficiency while also trying to maintain and expand the productive capacity of the community.

St Paul and Minneapolis — the 'Twin Cities' of Minnesota — dispose of some 2.5 million tons of human and solid waste a year. Technically 75-80 per cent of that waste stream can be recycled. What would that imply? One immediate benefit would be the creation of employment. Based on Canadian studies, six times as many jobs are created by recycling as by landfilling. If a similar ratio holds true for recycling versus incineration, the Twin Cities would create 6000 additional jobs by choosing materials recovery over combustion. Most of these jobs would be attractive for unskilled and semi-skilled workers, that is, for the hard core structurally unemployed who represent such a problem in our inner cities.

How far a community can go in this direction is a function of its size and density, industrial mix and political will. Take the example of scrap tyres, a small but troublesome waste item. Every American throws away the equivalent of one 20 pound tyre a year, causing numerous environmental problems. Many tyres resurface years after they have been thrown away. Tyre dumps have caught on fire and burned for months. And, the stagnant water in tyres provides an ideal breeding ground for mosquitos. As a result of all these factors, Minnesota banned land disposal of tyres two years ago.

Tyres can be shredded and burned but that captures only the direct energy value, maybe a penny a pound at today's oil prices. Tyres shredded into even finer pieces can be added to road asphalt and be sold for a few pennies more. But the real benefit comes when the scrap is converted into a valuable final product. A Minneapolis based firm developed a liquid polymer that can be added to pulverized tyres which allows the scrap tyre to compete both with virgin rubber and with plastics. Its product, TireCycle, sold for about 50 cents a pound. For Minneapolis and St Paul, the cost of tyre disposal in 1985 was about $4 million. If all tyres could be recovered, treated and sold for 50 cents a pound, the Twin Cities would avoid almost all of their disposal costs, in addition to creating a new industry with $20 million in gross sales.

But the opportunity was lost: as part of a well-intentioned but poorly-designed rural development scheme, the Governor of Minnesota used state financial subsidies to lure the new TireCycle plant to northern Minnesota, and thus away from its source of supply, the Twin Cities. As a result, the tyres for recycling had to be transported 200 miles north to the plant, and the final product had to be shipped an equal distance to its nearest markets The plant went bankrupt in early 1990.

Time for Change

The challenge, then, is to move away from the paradigm of the planetary economy and to create in its place an economy that allows us to produce most of what we need from our own local human, natural and capital resources on a sustainable basis. In that respect, I agree with John Maynard Keynes when he wrote:

> "I sympathise with those who would minimize, rather than with those who would maximize, economic entanglement among nations. Ideas, knowledge, science, hospitality, travel — these are the things which should of their nature be international. But let goods be homespun whenever it is reasonably and conveniently possible and, above all, let finance be primarily national."

Goods should be homespun to maintain a productive capacity and the skills associated with producers. When we abandon our ability to produce for ourselves, when we separate authority from responsibility, when those affected by our decisions are not those who make the decisions, when the cost and the benefit of doing things are not part of the same equation, when price and cost are no longer in harmony, we jeopardize our security and our future.

We also undermine democracy. Thomas Jefferson warned us that democracy depends on the widespread distribution of property. By property, he meant the ownership of productive assets. In his time, the ideal democrat was the yeoman farmer, the multi-skilled and largely self-reliant man and woman. Having the capacity to be self-reliant, such a person would be less willing to sell a vote for hand-outs from a political party. Having the knowledge of how things are made, and how the natural world works, such a person would be an informed participant in the political process.

One may argue that free trade is not the cause of all our ills. Agreed. But free trade as it is preached today nurtures and reinforces many of our worst problems. It is an ideological package that promotes ruinous policies. And most tragically, as we move further down the road to giantism, and planetism and dependence, we make it harder and harder to take another path. If we lose our skills, our productive base, our culture, our traditions, our natural resources, if we erode the bonds of personal and familiar responsibility, it becomes ever-more difficult to re-create community. It is very, very hard to put Humpty Dumpty back together again.

Which means we must act now. We need to challenge the postulates of free trade head on, to preach a different philosophy, to embrace a different strategy. There is another way, but to make it the dominant way we much change the rules, indeed, we must change our own behaviour. And to do that requires us not only to challenge the emptiness of free trade but to promote an economics as if community matters.

Books

A New Deal for the Environment?

FOR THE COMMON GOOD: *Redirecting the Economy Toward Community, the Environment and a Sustainable Future*, by Herman E. Daly and John B. Cobb, Jr., Beacon, Boston, 1989, $24.95 (hb) and Green Print, London, 1990, £9.95 (pb), 482 pp.

MAKING PEACE WITH THE PLANET, by Barry Commoner, Pantheon, New York, 1990, $19.95 (hb), 292 pp.

A politically effective green movement ostensibly requires a common analysis of the causes and prospective remedies of the environmental crisis. If the work of two profound and respected analysts, Herman Daly and Barry Commoner, is representative, we have a long way to go.

Both men have been refining their ideas for decades: Commoner beginning in 1966 with *Science and Survival*, followed by *The Closing Circle* (1971), and, among others, *The Poverty of Power* (1976); Daly, first with his anthology *Toward a Steady-State Economy* (1973), and later *Steady-State Economics* (1977). Yet, oddly, the political economist Daly propounds an anti-growth, communitarian, decentralist, biocentric viewpoint, while the political ecologist Commoner supports a growth- and urban-orientated, internationalist, anthropocentric perspective. And tragically, each work in its own way misses the point by failing to understand that *both* the profit-directed market system and economic growth bear responsibility, outside the former Soviet bloc, for the environmental crisis. The result of their failure is that seemingly fundamental critiques become limited calls for reform, reminiscent of the Keynesian New Deal of the 1930s that saved the system for bigger failures later on.

Herman Daly's latest book, written with theologian John Cobb, Jr., nevertheless represents a truly profound and comprehensive effort that is simultaneously an ecological critique of the profession of economics, of specialized academic disciplines in general, and a prescription for an environmentally-sound economy.

Modern economics went wrong, they argue, when it abandoned the classical political economy of Adam Smith, David Ricardo, Karl Marx, and J.S. Mill, which was interdisciplinary and historical, to adopt the model of physics, in the process becoming 'neo-classical' economics — highly abstract, mathematical, and, Daly and Cobb assert, often irrelevant. (They go so far as to maintain that no important policy debates have ever been resolved by econometric analysis.) Indeed, economists have traditionally dismissed environmental balance as simply a matter of 'internalizing the externalities', by which they mean that polluting products should be taxed according to the environmental costs they impose on society. Daly and Cobb rightly point out that the most significant externalities are so 'pervasive' (for example, global warming and ozone layer destruction) that pollution taxes are impracticable, and they liken the theory of externalities to Ptolemaic epicycles. However, the authors cannot accept the logical conclusion of their analogy and give up an outdated model. Instead they expect neo-classical economics to continue to play an extraordinarily important role within a broader paradigm that incorporates ecological thinking.

For the Common Good makes extensive use of A.N. Whitehead's fallacy of misplaced concreteness to formulate a critique of economic orthodoxy. This fallacy occurs when a conclusion based on highly abstract theory is applied unmodified to the real world. Fallacious reasoning leads economists to the following propositions: that the market can solve all problems in the real world with only minor corrections; that GNP is a general index of national well-being; that *Homo economicus* represents real people; and that nature ('land' to the economist) is nothing but another saleable commodity and a substitutable factor of production.

Determining the Optimum Scale

Despite their affirmation of the market mechanism, Daly and Cobb's criticism is extensive, in part following Marx. They observe that a competitive market contains the seeds of its own contradiction by tending toward monopolization, that it cannot produce a just distribution of income, and it tends to deplete "moral capital", a notion similar to one of the most enduring of Marx's criticisms which he termed "commodity fetishism". To this list, Daly and Cobb add the critical point, irrelevant to Marx's unecological schema, that the market has no means of determining the *optimum scale* of economic activity.

Economists generally ignore the issue of scale, an omission which is in part due to the acceptance of GNP as a general index of economic well-being. Yet, anyone can see that GNP includes all production, goods and bads (wheel chairs and stealth bombers), items which merely compensate for urban disamenities (police services), and those which attempt to correct environmental externalities (pollution control devices). By carrying out these and other corrections, Daly and Cobb construct an alternative index that shows economic growth in the US associated with increasing economic welfare prior to 1970, slight decreases during the 1970s, and significant decline in the 1980s. For the 1990s and beyond, they expect economic well-being to continue downward, due mainly to a decreasing output-input ratio in energy extraction. With the end of cheap energy that fueled the past two centuries' production boom, the cost of capital equipment will increase, worker productivity will decline, and inequality rise, pushing the index down dramatically.

The authors make an attempt to introduce the related notion of sustainable economic activity. They start with the concept of income expressed in Sir John Hicks' classic treatise *Value and Capital* as the maximum one can spend without impoverishing oneself in the long-run. This implies that capital — both natural and humanly-created — must be preserved to have a sustainable future. Most economists ignore the depletion of natural capital, implicitly assuming that humanly-created capital is a near perfect substitute for it. So long as economic growth increases humanly-created capital enough to offset the decrease in natural capital, the Hicksian sustainability condition is met. Daly and Cobb term this 'weak' sustainability. On the other hand, 'strong' sustainability requires that both humanly-created and natural capital be maintained intact. Unfortunately, the authors fail to explore the subject of strong sustainability, preferring to develop some implications of the weak version for Third World development, with the rather poor justification that

even this would be an improvement over current practice.

The Fallacy of *Homo Economicus*

Another fallacy of neo-classical economics concerns the concept of *Homo economicus*, the economic person. A fundamental building block of the paradigm is the isolated consumer, focused only upon individual consumption and not in any way affected by the suffering or satisfaction of other human beings. This assumption is necessary to demonstrate that the competitive market allocates resources optimally. However, the authors believe that in attempting to live up to the ideal of *Homo economicus*, we experience a diminished quality of personal relationships and the replacement of human commitments with appetites, desires, and tastes (commodity fetishism again).

Daly and Cobb place at the centre of their alternative vision the "person in community" — in families, neighbourhoods, small cities, regions and nations. These are to be supportive, non-repressive communities that respect diversity and individuality, contribute to self-identification, and permit democratic participation and maximum feasible, decentralized self-determination of important issues. Nations would support their members through a negative income tax (guaranteed annual income) and national health insurance. Governments at lower levels would become employers of last resort. Diversity would be protected by relying on markets and the profit-motive rather than central planning. In addition, corporate income taxes would be eliminated and all corporate profits would have to be distributed to shareholders as dividends.

A few questions loom large in this rosy corporate-communal picture. Without retained earnings, how do corporations obtain funds to invest in their incessant pursuit of maximum profits? The power of banks over economic decisions would inevitably grow. The authors are silent on how this — and corporate power generally — is compatible with the democracy they profess. They also ignore the question of the role of profits in a steady-state (a term surprisingly avoided by the authors) sustainable economy. No growth means zero net investment, and sustainability requires an end to personal luxury consumption (a market failure not mentioned by the authors). It would seem that profit-seeking as a motivating economic force would have no reason to exist, because rich shareholders could neither reinvest nor consume excess income in a steady-state sustainable economy.

Depletion Quotas and Birth Rights

The market faith the authors share with neo-classical economics prompts their advocacy of two highly problematic mechanisms for control of economic scale and population size: depletion quotas and transferable birth rights. Limiting economic activity and environmental damage by auctioning to the highest bidders an ecologically-determined quota of natural resource depletion rights would inevitably spur serious inflation that would impose the cost of environmental amelioration on those with low incomes. One suspects that the political process would still have to intervene to make hard resource allocation decisions (if petrol costs £5 per gallon, does that by itself solve the ensuing transportation crisis?). Similarly, Daly and Cobb would consider the sale of transferable birth rights to ensure that children would be born to those who want them most and can do the most for them. The authors fail to recognize that, if enforceable, this scheme could result in low-income racial groups shrinking in numbers from a lack of funds to purchase the right to have children. The scheme has many other authoritarian implications and it is highly unlikely that a meager negative income tax would do much to counter the overwhelming power of the market.

The single area in which the authors' commitment to community overcomes their market orientation, lies in their opposition to the free international movement of goods, capital, and labour. While some economic integration can be beneficial, continuing the trend toward a world market, they assert, is both unecological and inhumane — ultimately resulting in a world-wide equalization of wages near the subsistence level. One hopes that the adverse effect of self-sufficiency on quality, productivity and technical progress would be largely countered by improvements engendered by the increase in worker-owned and controlled enterprises advocated by the authors. More importantly, potential increases in international conflict resulting from enhanced nationalism are inadequately handled by Daly and Cobb with vague references to a world-wide "community of communities".

Religious Replenishment

Perhaps most disappointing is the authors' tendency to rely upon a religious faith based on Western monotheism to fill holes in their otherwise well-constructed reasoning. For example, their concern that the market depletes moral capital is apparently resolved by religious replenishment. Similarly, religious motivation restrains

alleged aspects of human nature which are inconsistent with their vision of community, such as the "will to dominate".

For the Common Good contains a striking dichotomy between timidness in theory (continued support of neo-classical economics) and boldness at the practical level (depletion quotas, national self-sufficiency). This may follow from the over-use as an analytical tool of the fallacy of misplaced concreteness which seems to conserve theory by directing criticism at its application rather than at the theoretical structures themselves. Nevertheless, Daly and Cobb have made a serious attempt to tackle the nearly intractable difficulties involved in the conversion to sustainability and their book deserves careful study.

Solar Limits to Growth

Barry Commoner's *Making Peace with the Planet* is a very different type of book which rarely rises above the practical level. Commoner's fundamental point is that the environmental crisis has arisen because major corporations decided after World War II to change the way some goods are produced (energy/chemical intensive agriculture, nuclear power) and the forms other goods take (synthetic detergents, plastic bags, bigger cars with high compression engines). The experience of the past two decades shows that the consequent disharmony between the ecosphere and the technosphere cannot be rectified by attempts to control the ecologically damaging effects of these technologies. The only solution is to adopt environmentally benign production techniques, not walking, biking, living in small towns, or taxing pollution which only serves to burden consumers, and certainly not by limiting economic growth or over-promoting energy efficiency which tends to be nullified by growth.

Commoner maintains that the perceived conflict between environmental quality and economic growth occurs solely out of futile attempts to control anti-environmental technology. If such technology is replaced, he believes continuous economic growth will not harm the environment. The only necessary limit to growth is found in the distant limits of available solar energy falling on the earth. Commoner evidently has no difficulty with the concept of hundreds of thousands, perhaps millions, of square kilometres in the US being covered with solar collectors, photovoltaic cells, and energy-storing crops.

Nor does population growth alarm Commoner. He foresees a stable world population of about ten billion in 40 or 50 years, as developing countries reach their demographic transitions with "more than enough" food capacity to feed all. The only problem is maldistribution of food and economic resources which developed countries can help overcome with colonial reparations in goods and ecologically appropriate means of production.

Corporate Power

Unlike Daly and Cobb, Commoner raises the issue of corporate power. One gets the feeling his own theory of the state has grown more conservative since his unsuccessful Citizens Party bid for the Presidency in 1980. He quite rightly criticizes Kirkpatrick Sale and the bioregionalists for failing to recognize the inevitable conflict of their vision with the corporate powers who make the economic decisions. At the other end of the environmental spectrum, reform organizations such as the World Wildlife Fund and the Environmental Defense Fund that attempt to negotiate compromises which control but do not prevent environmental damage risk the fate of hostages who take on the ideology of their captors. Ironically, Commoner's analysis has influenced William K. Reilly, former president of WWF and current head of EPA, who comes in for criticism in the book. News accounts indicate that the White House recently rejected an EPA proposal committing the federal government to use its massive purchasing power to promote recycled products and 'clean' technologies which was based on Commoner's notion of prevention over control. A similar proposal to require the US Government to order 150 megawatts of photovoltaic cells that would have stimulated the industry and drastically reduced cost was passed by the US Congress and vetoed by then President Jimmy Carter.

Barry Commoner clearly is not interested in theoretical discussions or spiritual transformation, nor does he share Daly and Cobb's faith in the market system. His focus is on practical measures that introduce social governance into economic decision-making. He does not discuss the need to change life-styles because that would be blaming the victims. Commoner's approach, while perhaps useful in the short- or medium-run, is too narrow to provide a holistic vision of the path the species must take if it and a diverse nature are to survive. Just as the Keynesian New Deal did not cure the economic problems of capitalism, the modifications of the market system presented in these two books do not provide ultimate answers.

John Hardesty

John Hardesty *is a writer and attorney, a former Professor of economics at San Diego State University, California, and co-author of* **Economic Growth vs. the Environment** *(Wadsworth, 1971).*

Time to Adopt the Organic Alternative

ALTERNATIVE AGRICULTURE, National Research Council, Washington, DC, 1990, $19.95/£16.60 (pb), $29.95 (hb), 448 pp. ISBN 0-309-03985-1 (pb) and 0-309-03987-8 (hb). Available from National Academy Press, 2101 Constitution Avenue NW, Washington, DC 20418, USA; or John Wiley & Sons Ltd., 1 Oldlands Way, Southern Cross Trading Estate, Bognor Regis, West Sussex, PO22 9SA, UK.

During the period of several months between this report being published in the US and becoming available in Britain, I came across several references in the press and elsewhere which stated that *Alternative Agriculture* gave full support to, and advocated a policy shift towards, organic farming. However this remarkable report does not specifically support and recommend the organic system *per se*. What it does do is to look closely at what a whole range of alternative practices, from just reducing chemical inputs in a conventional system through to adopting a full-blown organic or similar biologically-based system, can do in the face of the mounting environmental, economic, health and other problems associated with modern agriculture. It demonstrates clearly that any move in the organic direction away from intensive conventional farming will almost certainly benefit the producer, the consumer and the environment.

Following the serious economic decline in US agriculture in the early 1980s, the Board on Agriculture set up an expert committee to study the science and policies which have influenced the adoption of a range of alternative production techniques designed to control these problems. This 'Committee on the Role of Alternative Farming Methods in Modern Agriculture' published *Alternative Agriculture* after five years of deliberation.

There are four main chapters in the body of the report. The first reviews the evolution of US agriculture since World War II and considers its present position, particularly in relation to a range of federal policies. Chapter 2 looks at some of the economic and environmental consequences of conventional farming practices and government policies; in particular, water pollution, pesticide resistance, soil erosion, aquifer depletion and toxic residues in food. Chapter 3 examines the basic science supporting the farming practices widely used in alternative agriculture.

Finally, Chapter 4 analyses the economic potential of alternative systems. All these chapters are detailed reviews and analyses of their individual topics, rounded off with extensive reference lists, which provide a great deal of information concerning the value of alternative techniques.

A series of case studies complement the more theoretical analyses since they "provide insights into how the real world works". In other words, they are a range of cases of different types of farms, crop and livestock, fruit and vegetable, mixed and specialized farms, which, using either a partial or fully organic approach, can show that such systems are not only productive and economically viable but are also environmentally friendly.

Probably the most fascinating part of the report is the executive summary, which in 21 pages encapsulates a full justification of what many environmentalists, organic farmers and others have been saying and doing for many years; essentially that a holistic, biological approach to agriculture is the only way the world will maintain sustainable food production.

This is an American report, put together by a committee concerned with what has been happening to US agriculture. Nevertheless, almost all their conclusions can be directly applied to the position in other advanced western countries and can also be extrapolated to apply to less developed agricultural economies. Because of the breadth and depth of the investigations carried out by the Committee and the undoubted expertise of its members, *Alternative Agriculture* provides what is probably the best evidence yet of the problems arising from 50 years of intensive, conventional agriculture. This report should be required reading not only for students of agriculture and associated subjects but also for everyone involved in agriculture — from farmers themselves through to the bureaucrats and ministers who initiate and establish farming legislation both nationally and internationally.

David Hodges

David Hodges *lectures at Wye College, University of London, near Ashford, Kent.*

This is an edited version of a review which first appeared in *Biological Agriculture and Horticulture*, Vol. 7, No. 2, 1990.

BOOKS DIGEST

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

- WORLD RESOURCES 1990-91: *A Guide to the Global Environment*, The World Resources Institute *in collaboration with* The United Nations Environment Programme *and* The United Nations Development Programme, Oxford University Press, New York and Oxford, 1990, 383pp. ISBN 0-19-506229-9.

The annual update to this standard reference work. A mass of graphs, charts and tables provide a statistical backup to chapters on economic, environmental, population and resource issues. Special chapters focus on climate change and on Latin America.

- HIGH DAMS ON THE NARMADA: *A Holistic Analysis of the River Valley Projects*, by Vijay Paranjpye, Studies in Ecology and Sustainable Development 3, Indian National Trust for Art and Cultural Heritage (INTACH), 71 Lodhi Estate, New Delhi-110 003, 1990, 320pp. ISBN 81-900061-6-9.

An excellently produced analysis of the Narmada megaproject, now given the go ahead by the Indian Government. Using much unpublished and restricted material, Paranjpye attempts a conventional cost-benefit analysis but is always aware that, "behind the bewildering array of facts and figures lies the human being whose right to life, equal opportunity and knowledge are our main concerns, not only for this generation, but for generations to come".

- MIRACLE OR MENACE? *Biotechnology and the Third World*, by Robert Walgate, The Panos Institute, 9 White Lion Street, London N1 9PD, 1990, £6.95 (pb), 199pp. ISBN 1-870670-18-3.

An attempt to describe "objectively and dispassionately" what biotechnology is and what its implications for developing countries are. Walgate admits that in the present world economy, biotechnology is likely to serve the interests of the multinationals rather than Third World farmers. However he believes that biotechnology could be turned to the needs of the South, provided the appropriate research and development programmes are established and that, "even private industry may be prepared to help if the work boosts the company image and does not affect profits elsewhere".

- INSIDE THE BIOREVOLUTION: *A Citizens Action Resource Guide on Biotechnology and Third World Agriculture*, by Henk Hobbelink, Renée Vellvé and Martin Abraham, International Organization of Consumers Unions (IOCU), PO Box 1045, 10830 Penang, Malaysia and Genetic Resources Action International (GRAIN), Apartado 23398, 08080 Barcelona, Spain, 1990, 145pp. ISBN 967-9973-52-2.

This 'action resource guide' includes a useful overview on the issues of biotechnology, genetic resources and Third World agriculture; an annotated bibliography of books and papers on these issues; a list of contacts among citizens groups and intergovernmental organizations working on biotechnology and the Third World; an annotated list of periodicals; and two NGO statements on the application of biotechnology in the South.

- TOBACCO CONTROL IN THE THIRD WORLD: A Resource Atlas, by Simon Chapman with Wong Wai Leng, International Organization of Consumers Unions, PO Box 1045, 10830 Penang, Malaysia, 1990, 242pp. ISBN 967-9973-53-0.

A comprehensive guide to the various aspects of tobacco use, promotion and production in the Third World. Health and environmental effects are covered as well as the successful efforts of the big tobacco companies to dramatically increase tobacco use in the Third World and the meagre attempts by a few governments to control it (an estimated 1 billion people smoke worldwide and 3 million die annually from related diseases). A country-by-country guide gives details of morbidity and mortality, the incidence of tobacco use, which companies are involved, how much land is used for growing tobacco, controls, taxes, trade and relevant references.

- DIRECTORY OF EEC INFORMATION SOURCES, Euroconfidential, Brussels, 1990, 7700 Belgian Francs (pb), 720pp.

A massive reference book giving explanations of the workings of the EEC's labyrinthine bureaucracy, and addresses and contact numbers of thousands of agencies and individuals working for or under contract to the Commission, Parliament, Council of Ministers and other EEC institutions. Extremely useful for environmental groups involved in lobbying at the European level.

Patrick McCully

Letters

Marx and Gaian Sociology

Dear Sir,
It is broadly correct to argue as does Alwyn Jones ('Social Symbiosis: A Gaian Critique of Contemporary Social Theory', Vol. 20, No. 3, May/June 1990) that ecology has not been especially well served by sociology. On the other hand, we should try to do adequate justice to those social theorists who have attempted some strides in this direction.

A number of sociologists have in fact given sustained attention to the relationships between people and nature. Jones does not adequately stress, for example, the extent to which Tönnies saw the 'gemeinschaft' relations which characterized older forms of society as entailing regular, close and special relationships between successive generations of people on the one hand and animals, land and nature on the other. Modern 'gesellschaft' (incorporating urban life, the growth of markets and factories), however, was envisaged by Tönnies as resulting in the steady loss of these links. Again, the social theory of Parsons (a central figure in the development of modern social theory) insisted on seeing the physical and organic environment as representing constraints within which all forms of human action take place. Perhaps even more importantly, he envisaged the same rules of scientific method applying to both the physical and the social sciences. In short, a careful reading of the older forms of sociology may be more helpful to ecological analysis than Jones suggests.

It remains, nevertheless, true to say that almost all such theorists operated with a largely inadequate dichotomy between 'man' and 'nature'. In particular, they adopted an anthropocentric view of the relations between society and nature; one in which nature is implicitly viewed as something 'out there', to be used and exploited by human beings. An important exception, however, is the young Marx. Parts of his E*conomic and Philosophical Manuscripts* (1844) prefigured many of our contemporary concerns in a remarkable fashion. He wrote, for example:

> "The idea of one basis for life and another for science is a lie . . . Natural science will in time subsume the science of man just as the science of man will subsume natural science: there will be one science."

Marx was arguing for an eventual unity between the natural and social sciences. He saw such a fusion as a crucially significant event in human history since people would appreciate their proper relations with nature and, in doing so, they would gain a more complete understanding of themselves. The Gaian hypothesis, with its central suggestion that 'man' and 'nature' are symbiotically linked, can be envisaged as one important indication that the 'one science' demanded by the 26 year-old Marx is now under construction. It remains to be seen, of course, whether such a science can in fact be fully developed and whether it will lead to a revised vision of ourselves, our relation to nature and our actions.

Yours faithfully,
Peter Dickens
Lecturer in Urban Studies
School of Cultural and Community Studies
The University of Sussex
Brighton BN1 9QN

Confusing Science with Scientism

Dear Sir,
While I am in agreement with Edward Goldsmith ('Evolution, Neo-Darwinism and the Paradigm of Science', Vol. 20, No. 2, 1990) that we must save the baby (evolutionary theory) and throw out the bathwater (Neo-Darwinism); I shall argue that we must not, as well, throw out the bassinette (Science). Paradigms change and science may yet prove Goldsmith right, that 'organicism' is a better world view.

I think what Goldsmith meant by science is 'scientism' or an uncritical 'naturalism'. Those doing science must look for 'causes' and 'mechanisms'. Many evolutionists are actively looking for mechanisms linking the environment with development and evolution. Proof of this is the intense interest being shown in the processes of heterochrony (changes in timing during development).

One such researcher who felt he had found a mechanism which explained heterochrony, was the late Ryuichi Matsuda. He called his evolutionism, 'pan-environmentalism'.[1] In 1985, in defence of Matsuda's theory, I wrote:

> "A lifetime spent studying abnormal metamorphoses, life histories, comparative physiology, and endocrinolgy of arthropods has brought Matsuda to the view that changing environmental factors act upon known physiological processes of organisms, creating new regulatory genetic changes.
>
> "All of the life sciences depend upon evolution for their foundation. Evolutionary theory, until quite recently, has largely been the domain of paleontologists, paleobiologists, population geneticists and ecologists. Specialists from these disciplines have recently shown a renewed interest in canalization, but have mostly focused on constraints on development. To date, physiologists have had little impact on the evolutionary sciences. But it may well be physiologists who contribute the next significant chapters in the provisional synthesis of evolutionary theory by outlining the actual mechanisms of plasticity. If this is true, Matsuda will have prefaced an exciting era."[2]

Yours faithfully,
Roy D. Pearson
Science and Medicine Library
University of Toronto
Ontario M5S 1A5

References

1. Matsuda, R., 'The evolutionary process in talitrid amphipods and salamanders in changing environments, with a discussion of "genetic assimilation" and some other evolutionary concepts', *Can J Zool.* 63, 1985, pp.733-749. Matsuda, R., Animal Evolution in Changing Environments, Wiley, New York, 1986.
2. Pearson, R.D., 'Duncan's critique of Matsuda', *Can J Zool.* 63, 1985, pp.2982-2983. Pearson, R.D. (Book Review), *Acta Biotheor.* 37, 1988, pp.31-32.

Classified

MISCELLANEOUS

The IWA (Inland Waterways Association) needs used postage stamps of all denominations, Green Shield, Pink, Look, Premier Gold, Co-op and Blue Chip stamps, Texaco, BP. Shell, Esso, Gulf, Fina etc petrol vouchers. Please send to WRG/IWA Stamp Bank, 114 Regent's Park Road, London NW1 8UQ. This is a permanent request and the used stamps are turned into cash or goods for sale to help restore and run Britain's Inland Waterways.

I am looking for a small language school or an organic farm, in which some Spanish children (15) would learn, not only English, but also organic agriculture, hand-craft, English games, walks in the country etc. i.e. something different. If you know of such a place please write to me. With thanks Rafael Montes Barrio, c/Gran Capitan, 26 Porteria. 28933 Mostoles, Madrid, Spain.

HISTORY OF ENVIRONMENTAL CONSERVATION. We search histories and chronologies of the ecology movement everywhere in the world with exact dates of landmark events (demonstrations, protests, conferences, field actions, outstanding books, etc.) Centre de Documentation Eco-Philosophique, Sigoyer, F04200, SISTERON, France.

KASANKA NATIONAL PARK, ZAMBIA. Volunteers are sought to assist in research on birds and mammals for this unique holistic non profit conservation project. Working holidays with scientists in the field in association with the Durrell Institute for Conservation and Ecology, University of Kent and the Manchester Polytechnic—17 days round trip £1,295 all inclusive. For details: Peter Moss, 146 Gloucester Road, London SW7 4SZ. Tel: 071 370 5032.

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DIARY DATES

APPLE DAY—a demonstration of variety and taste. Sunday 21 Oct 1990, The Piazza, Covent Garden, London WC2. Common Ground's Orchard Campaign is staging this day to demonstrate the importance of Britains' orchards and attract apple lovers everywhere. There will be various stalls by juice and cider makers, nurseries, fruit farm owners as well as an 'Apple Roadshow' for people to bring fruit from their unnamed garden trees for identification. For further information contact Neil Sinden or Angela King on 071 379 3109.

The National Society of Clean Air is holding its 57th conference BRIGHTON 1990. Dates: 15 to 18 October 1990, subjects: Acid Rain—Crisis in Europe; Global Energy Strategy; Assessing the Environment; Noise Control; Toxics and Nuisance; Local Authorities New Powers. For further information write to NSCA, 136 North Street, Brighton BN1 1RG.

The Centre for Continuing Vocational Education is holding a two day updating course entitled ENVIRONMENTAL AIR POLLUTION UPDATE. This will be on the 29-30 November 1990 at the University of Sheffield. Further enquiries please contact Mrs Kathleen Wainwright, CCVE, 65 Wilkinson Street, Sheffield S10 2GJ. Tel. 0742 768653.

CALL FOR PAPERS

ECO-PHILOSOPHY SYMPOSIUM in Nairobi—1991. An extraordinary congress of philosophy will take place in Nairobi, Kenya, 21-25 July 1991. The organisers have agreed to schedule a symposium on Eco-philosophy as a new Metaphysics. The coordinators of this symposium are: Henryk Skolimowski, Humanities, 130 Enging Blgd. Univ. of Michigan, Ann Arbor, Mich. 48109, USA and Hwa Yol Jung, Moravian College, Bethlehem, Penn. 18018, USA. If you are interested, kindly send a paper up to 10 pages—original contributions to Eco-philosophy, please to: Hwa Yol Jung at the above address.

FULL CONFERENCE FACILITIES
available at Worthyvale Manor Conference Centre, Camelford, Cornwall PL32 9TT. Please write for prospectus.

UNITING IN HEALING. A conference on holistic health including traditional and alternative therapies. 27-29 October 1990 at Elmfield School, Love Lane, Oldswinford, Stourbridge, W. Midlands. For further details contact Dr Helen Ford, The Hollies, 9 Redhill, Stourbridge DY8 1NA. Tel. 0384-379740.

DAY VISIT TO RURAL DEVELOPMENT PROGRAMME, 27 October 1990, Emerson College, Forest Row, Sussex. Environmentally sensitive techniques in hand tool husbandry for small scale quality food production. "Raised bed" system for vegetables with experiments in "companion" planting. Experiments in increasing soil fertility without importing fertilisers. SAE to Applied Rural Alternatives, 10 Highfield Close, Wokingham, RG11 1DG for full information.

The Society for Ecological Restoration is holding its Third Annual Conference for Ecological Restoration in Orlando, Florida, USA, 19-23 May 1991. The main areas of discussion will be Restoration on Surface-mined Lands; Restoration in the Third World Tropics; The Role of Restoration in National Forests. Deadline for submission of abstracts is 15 January 1991. For further details regarding papers or attendance please contact Society for Ecological Restoration, Lynn Alford Schmidt, 1207 Seminole Highway, Madison WI 53711, USA. Tel. 608-262 9547.

THE WORLDWATCH PAPER SERIES

The following Papers have recently been published in this very important Series by The Worldwatch Institute, USA:

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Clearing the Air: A Global Agenda (No 94)
Apartheid's Environmental Toll (No 95)
Swords into Plowshares: Converting to a Peace Economy (No 96), The Global Politics of Abortion (No 97).

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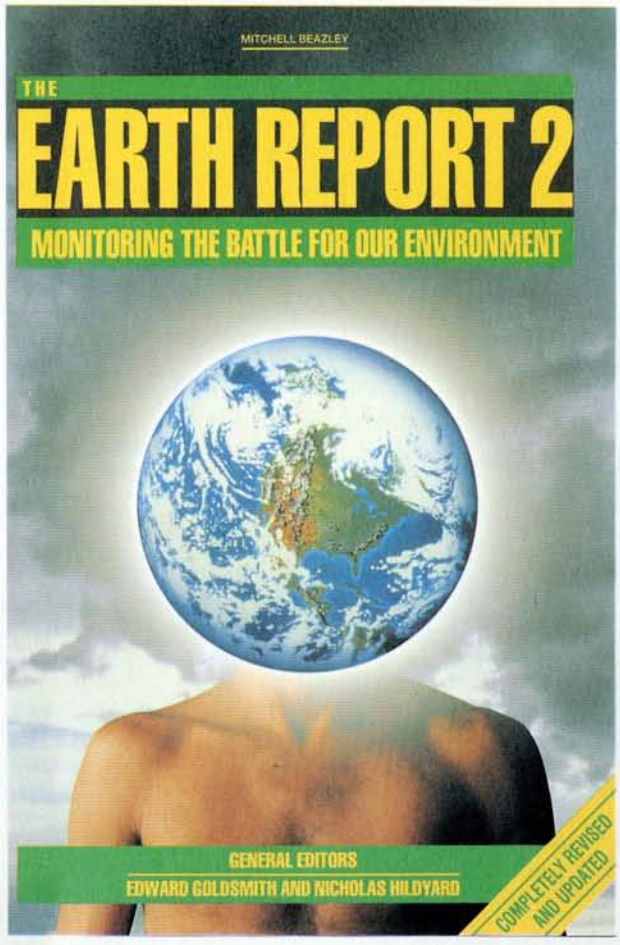

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