The Ecologist

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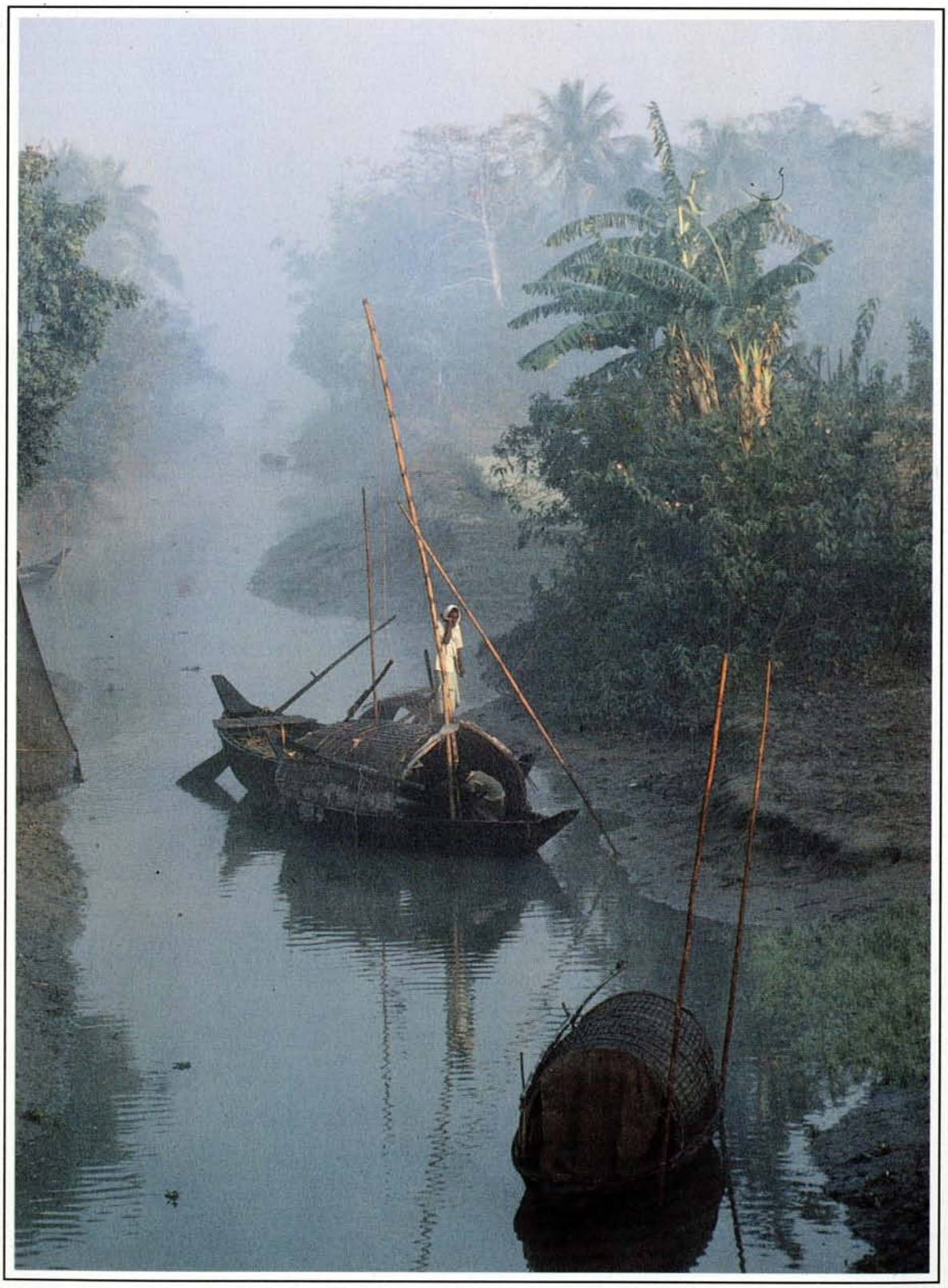

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The Ecologist

Vol. 22, No. 5, September/October 1992

Editorial

Feature Articles

The North American Free Trade Agreement between Canada, Mexico and the US is the latest in a series of steps towards the global deregulation of trade. The withdrawal of protective measures for agriculture will hasten the demise of small farmers in all three countries, while the pressure to compete will result in further environmental degradation.

The nuclear industry maintains that the large amount of radioactive tritium released from nuclear plants poses no risk to the public; but recent reports indicate that there may be a link between tritium emissions and the incidence of birth defects and cancers.

US cancer research institutes, preoccupied with cure rather than prevention, claim they are "winning the war against cancer". Yet while cure rates have hardly improved, the incidence of many cancers has risen alarmingly. By attributing this increase largely to smoking and dietary habits and by ignoring the role of chemical pollutants, the cancer establishment, including the pharmaceutical and petrochemical industries, serves its own interests.

The World Bank's Flood Action Plan proposes a controversial system of embankments to temper Bangladesh's river floods, yet fails to address the far more urgent problem of cyclone damage. It makes no attempt to combat the social inequities that leave millions of people vulnerable to cyclonic flooding.

Feature Book Review

Cover photo: A Bangladeshi fishing boat (Mark Edwards/Still Pictures).
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Withdraw from Sardar Sarovar, Now

An Open Letter to Mr Lewis T. Preston, President of the World Bank

Dear Mr Preston,

We write to you to demand that your bank cease funding the massive Sardar Sarovar Projects in Western India. As we write, tribal people and activists in the villages of Vadgam and Manibeli are at imminent risk of death by drowning as the monsoon-swelled Narmada River rises behind the partially-built Sardar Sarovar Dam. We are sure you are well aware that tens of thousands of people in the Narmada Valley have vowed to drown rather than leave their homes.

If even one person drowns, Mr Preston, we will hold you personally responsible. In June, the team of independent experts, appointed and paid by your bank to assess the project, unequivocally concluded after 10 months' work:

> "We think the Sardar Sarovar Projects as they stand are flawed, that resettlement and rehabilitation (R&R) of all those displaced by the Projects is not possible under prevailing circumstances, and that the environmental impacts of the Projects have not been properly considered or adequately addressed. Moreover, we believe that the Bank shares responsibility with the borrower for the situation that has developed."

But you and your staff have made it clear that you have no intention of abiding by the Independent Review's recommendation to "step back from the Projects and consider them afresh." Instead, you claim that "continued Bank support for the Narmada projects is justified." Mr Preston, the Independent Review shows that not only is continued Bank support for Sardar Sarovar totally unjustified, but so is continued public support for the Bank if you are blithely to continue using taxpayers' money to fund these Projects.

On the day the Report of the Independent Review was released you said: "the hope — and the challenge — is that the remedial measures stimulated by the report will lead to effective solutions to the problems which have afflicted the Narmada projects." This is cynical nonsense, Mr Preston. The evidence of the Independent Review, and the massive local opposition to the dam, show quite clearly that there are no "remedial measures" which can prevent the Projects from being a human and environmental disaster. No "effective solutions" exist for a scheme which aims to disrupt the lives of hundreds of thousands of people on the basis of a totally dishonest cost-benefit analysis. The challenge from the people of the Narmada Valley is for you to pull out or to face the responsibility for their deaths.

Your bank's management, in their response to the Review, imply that if you were to withdraw from the Projects, they would "proceed under much less favourable circumstances." This is typical World Bank arrogance. The truth is that Sardar Sarovar has only proceeded because of the World Bank, and if the Bank withdraws, the Gujarat Government will not be able to secure the funds to continue its massive folly.

Violating Bank Policy

As you well know, Mr Preston, the policy of your bank requires the resettlement and environmental aspects of projects to be fully assessed before any agreements are entered into. This requirement was totally ignored when your bank signed the 1985 credit and loan agreements for the Sardar Sarovar dam and canal with the Government of India and the Governments of the States of Gujarat, Madhya Pradesh and Maharashtra.

At this time, the Independent Review notes, "no basis for designing, implementing, and assessing resettlement and rehabilitation was in place . . . no one knew the scale of the displacement that would result from the Sardar Sarovar Projects, nor did anyone have anything like a true picture of the peoples who were displaced, nor had the people themselves been consulted." The 460km-long canal, which will affect 140,000 families, 13,000 of whom will lose all or most of their land, was "overlooked" when the agreement was signed.

Avoiding "Engagement With Reality"

The great majority of those to lose land to the over 200km-long Sardar Sarovar reservoir are from Madhya Pradesh, where, according to the Independent Review, "virtually no steps have been taken towards resettlement and rehabilitation." Even the mission that your bank sent to the Narmada Valley this July concedes that in Madhya Pradesh, "implementation problems are severe, and include lack of planning, no land acquisition, weak organization, inadequate staffing and inadequate data."

Concerns over Madhya Pradesh's capacity to resettle the more than 23,000 families who may be affected in the state are not new. Review missions from your bank noted the problems in 1985, 1988, 1989, twice in 1990, and twice in 1991. The legally-binding objectives of the 1985 agreements — among which are that oustees should be able to relocate as whole communities or families, and that they should not suffer a drop in their standard of living — have been consistently flouted in Madhya Pradesh, yet your bank has done little more than hope the problems will go away — and to send yet another mission.

The report of your bank's July 1992 mission is typical. It concludes that, "under current conditions, satisfactory resettlement of Madhya Pradesh oustees by the date of final submergence is almost impossible." Yet in the very next sentence it says, "with improved policies and implementation capacity, successful resettlement and rehabilitation could be carried out." Are you and your staff really naive enough to believe this expedient humbug? Surely, Mr Preston, you must agree that this conclusion is yet more evidence of what the Independent Review calls your bank's "tendency to press forward in a manner that avoids engagement with reality."

From 1989, your missions to Madhya Pradesh were either unable to make field visits, or had to cut short their visits, because of the strength of local opposition to the Projects. Far from abating, this opposition, in the words of the Independent Review, "has ripened into hostility. So long as this hostility endures, progress will be impossible except as a result of unacceptable means." Are you, Mr Preston, prepared to take the responsibility for these "unacceptable means"?

Already in the Narmada Valley, those opposing Sardar

Sarovar have been subjected to "arbitrary arrest, illegal detention, beatings and other forms of physical abuse." According to human rights group Asia Watch, these abuses "appear to be part of an increasingly repressive campaign by the state governments involved to prevent [anti-dam] groups from organizing support . . . and disseminating information about the environmental and social consequences of the project." Are you and your staff, Mr Preston, prepared for the inevitable escalation in human rights abuses which will result from your decision to continue funding the Projects?

Living Like Dead People

Under the credit and loan agreements, oustees from the other two states have the right to choose to take land in Gujarat. The Independent Review notes that Gujarat may have to resettle 15,000 families from Maharashtra and Madhya Pradesh and expresses concern over the "severe strain" which this would impose on Gujarat's limited resources. Already difficulties in obtaining land for the 3,000 families (out of 4,700 to be affected by submergence in the state) which Gujarat claims to have resettled, have meant that oustee families and villages have been scattered among many different resettlement sites.

How, Mr Preston, will Gujarat find land not only for the remaining submergence oustees from its own state but also for the families from outside the state? How will Gujarat meet the recommendation of the Independent Review to find land for the 13,000 families who will, in effect, be made landless by the canal, and for the 950 families displaced by the town built to house the workers on the dam? The answer is that this land can only be made available by displacing yet more people. This July, forest officials in Maharashtra shot dead a tribal woman outside a village whose land is to be taken over for a resettlement site. How much "secondary displacement" will your bank consider acceptable, Mr Preston, before it will conclude that the land is simply not available?

Even when families are given replacement land it does not mean that they can regain their previous quality of life. Among the most common of the many grievances of those who have shifted to the resettlement sites in the plains of Gujarat are infertile or stony land; inadequate water supplies; a lack of fuelwood and fodder; the discomfort of the "temporary" tin sheds in which many have had to live for several years; the termites which destroy the oustees' traditional houses when these are dismantled and moved to the resettlement sites; and the long distances between people's houses and their fields.

Mr Preston, these people have lived in the forests of the Narmada Valley for generations. The forests have provided them with fuel, food, fodder, medicines, building materials and many of their other daily requirements without the need to earn or borrow money. The Narmada (in Sanskrit meaning, "giver of bliss") has not only provided them with fish and plentiful clean water, but is of immense spiritual importance to both tribal people and Hindus. To the tribal people, the Bhils, the Narmada is the mother from whom they were created. Again and again the Independent Review were told: "Our gods cannot be moved from this place, so it is difficult also for us."

How, Mr Preston, will you measure the emotional impact upon these people of leaving their mother Narmada, of leaving the lands and the forests of their ancestors? With what "remedial measures" will your staff solve this cultural dislocation? How will they factor these considerations into their measurements of "standard of living"?

In the words of Maganbhai Rohitbhai, a young farmer who was shifted to Malu from the village of Vadgam, just a mile upstream from the dam site, "there are times when we want to just run back to Vadgam. At least there we were living." In March this year, 24 families decided that they could no longer bear the conditions at Malu, and moved back to Vadgam to homes and lands which are at risk of submergence during this monsoon. According to one Vadgam farmer, Shankarbhai Tadvi, "we will drown before we go back to Malu".

Perhaps one of the most serious consequences of eviction is the breaking up of communities and even families between different resettlement sites. What right has the Bank to disperse families, to break up village communities, to deprive people of their friends and relations? Oustees from Madhya Pradesh who had been resettled in Gutal, Gujarat, told the Independent Review: "Our society is not here. We are like dead people. What is the point of living like dead people?" What right do you have, Mr Preston, to inflict such suffering on people?

You may bluster, but there are no reasons to suppose that the Bank can possibly rectify the resettlement problems inherent in Sardar Sarovar. As the Independent Review notes, "the problems besetting the Sardar Sarovar Projects are more the rule than the exception to resettlement operations supported by the Bank in India."

Gross Delinquency

The management of your bank tell us, in response to the Independent Review, that the environmental impact of the dam can be mitigated with "ameliorative measures." Again we have little reason to believe you. Time and again, environmentalists have highlighted the terrible environmental destruction caused by projects funded by your bank. And, time and again, you have fobbed off critics with promises of reform in the future.

It is now 22 years since your bank first announced that it was "taking steps to assure that the projects it finances do not have serious adverse ecological consequences." Yet the Independent Review confirms that nothing has changed, referring to "an institutionalized numbness at the Bank and in India to environmental matters." It even suggests that your staff might be guilty of "gross delinquency in the handling of environmental matters."

The 1985 agreements required an environmental workplan by the end of the year. It was not made. The deadline was extended to 1989 and three years later it is still not available. As the Independent Review concludes, "the history of the environmental aspects of Sardar Sarovar is a history of non-compliance." Your bank's July 1992 mission recommended that "a detailed environmental management plan be produced as soon as possible." When will this be? In another seven years' time?

Your officials have resorted to trickery to disguise the true environmental impact of the project. They know that the proposed Narmada Sagar Projects in Madhya Pradesh are essential in controlling water releases to the Sardar Sarovar Projects downstream. An internal memorandum even refers to the two sets of Projects as "a technically and economically interdependent development complex". Yet, as the Independent Review notes, from 1985, "the Bank chose to proceed as if the environmental issues arising from the Sardar Sarovar Projects were somehow discrete, orphaned ecologically from the family of projects within which they were conceived and will operate."

Although the Madhya Pradesh government has recently awarded the contract for Narmada Sagar, it is not at all clear that the state will manage to secure funding for a project which is even more of an aberration in human, environmental and economic terms than Sardar Sarovar. In fact, Mr Preston, Narmada Sagar appears such a lunatic scheme that we do not believe even your bank will finance it.

The costs of the project in terms of human health have also been cynically disregarded. A consultant employed by your

bank warned in 1988 that malaria presented a serious threat in the vicinity of the reservoir and the network of canals and drains, and that the potential for schistosomiasis (bilharzia) to develop in the project areas "must be viewed very seriously." The consultant said that were schistosomiasis to get a foothold, "all of the Gujarat and Madhya Pradesh populations would either have to avoid exposure to the reservoirs and irrigation water for all time, which is practically impossible to accomplish, or most of the people in the areas would be subject to schistosomiasis from childhood onward."

How then, Mr Preston, can you possibly explain that no measures have been taken to deal with these threats? How is it that, in the words of a Bank consultant "the projects have been planned, designed and executed without incorporation of health safeguards"? Why should we have any faith in your July 1992 mission calling for an "environmental health management plan", when the "specific action plan" on water-related diseases your staff called for in 1985 still does not exist?

Deficiencies, Inconsistencies and Contradictions

Given the susceptibility of large-scale perennial irrigation schemes to waterlogging and salinization, one might have expected your bank to have made a thorough study of environmental conditions in the areas to be irrigated before it signed the 1985 credit and loan agreements. It did not. The Independent Review remarks how, "arriving as we did well after canal construction had started and many years after impact assessments were supposed to have been made, we did not expect to find so many deficiencies, inconsistencies, and contradictions in basic information."

Although much of the prospective area consists of black cotton soils, which are particularly prone to waterlogging, it has been assumed that the entire area is suitable for irrigation, thus grossly inflating the potential benefits. The Independent Review believes that "there will be serious problems with waterlogging and salinity." Seepage from the 75,000 kilometres of distribution canals is inevitable, causing local groundwater to rise to the surface and, with it, the salts that will salinize the irrigated soils. The result will be the rapid degradation of large tracts of land.

It is obvious, Mr Preston, that the availability of water for irrigation has been grossly exaggerated. The Gujarat authorities claim that the requisite nine million acre feet of water from the Narmada will be available 75 per cent of the time. Yet a study which your bank commissioned in 1982 showed that the canal would flow at less than half its capacity two-thirds of the time and that the design flow rate would probably be achieved less than six per cent of the time.

In an internal memorandum in January 1992 your own staff assume that without Narmada Sagar, the irrigation benefits of Sardar Sarovar should be downgraded by 30 per cent. You know as well as we do that this alone would make the project totally uneconomic, the more so since it is also suggested that the claimed hydroelectric benefits would be reduced by 25 per cent. Yet you persist in maintaining the myth that Sardar Sarovar's costs are outweighed by its benefits.

Nor are these the only examples of "benefits" being based on massaged figures and flawed assumptions. The Independent Review points out that in 1991 the Gujarat government increased its estimate of the number of people to receive drinking water from the Sardar Sarovar Projects by a quarter — although the amount of water allocated stayed the same as before. Despite the fact that domestic consumption is supposed to be the first priority for allocation of the Sardar Sarovar water, no rural or urban water supply plans have even been drawn up.

Your experts have also manipulated the figures on the lifetime of the dam, the Independent Review noting that the reservoir will probably silt up twice as fast as your bank claims. Your staff know that by reducing the storage capacity of dams (and thus their irrigation and hydroelectric potential), the high siltation rates which are common to large dams in the tropics play havoc with the economics of these projects.

The dishonest economic analysis for Sardar Sarovar is no different from hundreds of other water projects funded by your bank. The *India Irrigation Sector Review* issued by your bank in 1991 gives a litany of costly failures: low economic benefits, skyrocketing costs, unrealistic assumptions about water availability and irrigation efficiency, and huge backlogs of unfinished and under-utilized projects. The *Sector Review* states, "with rare exception there is no justification in the medium term for new surface irrigation investments" and that the "development agenda for at least the next decade should concentrate on improving performance of existing irrigation."

Monumental Fraud

Bittu Sahgal, writing in India's *Illustrated Weekly*, has called Sardar Sarovar "a monumental fraud upon the people of Gujarat." He is right: and, in funding and promoting the project, Mr Preston, you and your staff are party to this fraud. Indeed, it is difficult to avoid the conclusion that the real reason for building Sardar Sarovar is unconnected with the benefits you claim will accrue to the people of the area. It has more to do with satisfying the short-term interests of powerful commercial and political lobbies, who stand to make substantial sums from the project or to gain votes and prestige.

Meanwhile those affected by the project — those who you have condemned to live "like dead people"; those whose children will die of malaria; those whose lands will be degraded by waterlogging and salinization; and those whose forests and homes will be flooded — will pick up the costs.

This criminal enterprise has lasted too long, Mr Preston. You and your staff have ignored your critics so far on the grounds that their criticisms were biased and exaggerated. But everything they have been saying has been more than confirmed by the Independent Review, set up by the World Bank itself, and headed not by a human rights fanatic or a wild-eyed greenie but by Mr Bradford Morse, ex-Administrator of the United Nations Development Programme.

Now it appears you have decided to ignore him too, along with his distinguished colleagues on the Review team. If you and your staff continue to disregard the conclusions of the Independent Review, you will have confirmed that your bank is beyond reform. If your bank does not withdraw from Sardar Sarovar, we will call upon NGOs and activists from both North and South to put their weight behind a campaign to close down the World Bank once and for all.

Our immediate priority will be to urge taxpayers, donor governments and NGOs to oppose the $18 billion replenishment of the International Development Association, the division of the World Bank which gives concessional loans to low income countries. We can no longer tolerate public money being used to ruin the lives of people you are supposed to help.

In 1985, Senator Kasten, then Chair of the US Senate's Appropriations Committee, stated that if the public only knew what damage the World Bank was wreaking, "they would be out on the streets demanding why this money was being spent on this kind of destruction." Believe us, Mr Preston, if your bank does not immediately withdraw its support for Sardar Sarovar, we intend to turn that rhetoric into reality.

The Editors

Image Bank

Feed corn stored in the United States. Subsidies for US agribusiness create vast surpluses that dominate the world market. Eighty-five to ninety per cent of US and EC grain exports are handled by just five companies. Under these conditions, any talk of a "free market price" is sheer nonsense.

Free Trade versus Sustainable Agriculture

The Implications of NAFTA

by

Mark Ritchie

In the name of "free trade", agribusiness in the US has sabotaged the farm support system that since the 1930s protected farmers from the vagaries of the market. In its place, a system of "deficiency payments" has been introduced, which benefits grain corporations, rather than farmers. The recent signing of the North American Free Trade Agreement (NAFTA) by Canada, Mexico and the US has taken the process a step further; measures to protect small farmers, consumers and the environment in all three countries are likely to be abolished.

Two competing visions have emerged of the future of agriculture. The first, often referred to as sustainable agriculture, calls for social and economic initiatives to protect the environment and family farms. This approach emphasizes the use of public policy to preserve soil, water and biodiversity, and to promote economically secure family farms and rural communities. It calls for farming practices which are less chemical- and energy-intensive, and marketing practices which place a high priority on reducing the time, distance and resources used to move food between production and consumption. Another goal is to improve freshness, quality and nutritional value by minimizing processing, packaging, transportation and preservatives.[1]

An opposing view, often referred to as the "free market", "free trade" or "deregulation" approach, pursues "economic efficiency" in order to deliver crops and livestock to processors and industrial buyers at the lowest possible price. Almost all social, environmental and health costs are "externalized", ultimately to be paid for by today's taxpayers or by future generations. Basing their arguments on neo-classical economic theories dating back over two hundred years, the proponents of this approach maintain that any government intervention in the day-to-day activities of business diminishes economic efficiency. They seek to scale back or eliminate farm programmes such as price supports and supply management, as well as land-use provisions designed for environmental protection. In world trade, they support the opening of state and national borders to unlimited and deregulated imports and exports. These policies are heavily promoted by agribusiness corporations involved in the trading and processing of farm commodities, which want to pay as low a price as possible, and by suppliers of farm inputs, who want to sell a maximum amount of chemicals, fertilizers and other products.[2]

The differences between these two conflicting views lie at the heart of the debate over modern agricultural policy. Recently the controversy has been given particular prominence by the trade negotiations taking place under the auspices of both the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trade (GATT).

Mark Ritchie is the Director of the Institute of Agriculture and Trade Policy, Minneapolis, USA.

Trade versus Husbandry: A Recurrent Conflict

Conflicts concerning agricultural trade and the environment have occurred throughout history. For example, a book entitled *Grain Through the Ages*, published by the Quaker Oats Company, describes the effects of free trade upon the Roman Empire in the first and second centuries BC:

"One reason for the decline of grain farming in Italy was the importation of grain into Rome from the rich grain lands of Sicily and Egypt. In Sicily these grain lands had been appropriated by rich men and scheming politicians who farmed them with slave labour. As a result the markets of Rome were flooded with cheap grain. Grain became so cheap that the farmers who still owned small pieces of land could not get enough money for the grain they raised to support their families and pay their taxes. They were forced to turn their farms over to rich landowners. On the land of Italy slave gangs working under overseers took the place of the old Roman farmers, the very backbone of the state.

"The farmers, after their land had been lost, went into the city walls, leaving the scythe and the plough. They worked now and then at a small wage. They ate mostly bread made of wheat which was distributed to them by any politician who wanted their votes at an election.

"The land itself became poor . . . The use of slaves meant that the land was badly worked because usually the slaves did as little as they possibly could unless they were under the eye of the overseer."

This example from ancient Italy mirrors many of the concerns we face today, even down to the provision of welfare for displaced farmers. But the ideological debate over "free trade" is relatively recent, dating back to the 18th and 19th centuries. The first climax of this debate came in 1846, when the free trade advocates in the British parliament voted to repeal the Corn Laws which regulated imports of wheat in order to protect British farmers from sudden drops in prices. The main advocate of repeal, Richard Cobden, was quite aware of the environmental implications of his free trade proposals. In one of his most famous speeches before Parliament, he proudly explained that free trade would lead to a dramatic intensification of British agriculture, including "draining, extending the length of fields, knocking down of hedgerows, clearing away trees which now shield the corn." He urged farmers to "grub up hedges, grub up thorns, drain, and ditch."

Many, if not most, of Cobden's free trade colleagues understood that free trade would put enormous economic pressure on British farmers, just as the cheap imports from slave estates had done to the farmers in Italy, and that in their struggle to survive British farmers would intensify production, by draining wetlands, cutting hedgerows and clearing woodland. Despite much destructive activity of this kind between 1846 and 1870, English agriculture went into a long decline and by 1903 Britain was importing nearly four-fifths of its wheat.

A Money-Laundering Scheme

The "free trade vs. sustainable agriculture" debate has a long history (*see* Box above), but in the 1970s and 1980s, it took on a new importance as presidents Nixon and Reagan, with the help of the Republican-controlled Senate, implemented the most free-market oriented US farm policy since the 1920s. Legislative changes, culminating in the 1981 and 1985 Farm Bills, adapted, undermined and finally sabotaged the farm support system that had been elaborated in the 1930s to protect farmers from the vagaries of the economic system.

The policy of minimum farm prices for grain was first established in F. D. Roosevelt's presidency, through the US Department of Agriculture's Commodity Credit Corporation (CCC) crop loan programme. Under this system, Congress established an annual minimum price per bushel — the CCC loan rate — roughly equivalent to the average cost of production. If the price offered by the grain corporations at harvest time fell below this price floor, farmers had the right to borrow an amount of money equal to the CCC loan rate for every bushel they produced; this was intended to tide them over until the following summer, when prices would normally rise. If the grain corporations still refused to offer prices to farmers above these minimum levels, then farmers could forfeit this grain to the government without repaying the loan. This system worked well: in most years, the grain companies offered prices above the minimum level in order to get farmers to sell, and there was very little forfeiting of grain.

However the system was bitterly opposed by agribusiness corporations who resented the fact that the government intervened to keep prices at production costs levels. Grain traders wanted to build up a surplus of cheap grain to export, while petrochemical companies and farm machinery manufacturers saw this as a way of increasing sales. In 1971, President Nixon began to panic about rising US trade deficits, and agribusiness spotted an opportunity to get rid of the Roosevelt programmes. They suggested to Nixon that if he lowered the loan rate to below the cost of production it would give them an international price advantage, making it possible for them to squeeze other countries, especially France, out of world markets.

US farmers, unwilling to see prices fall below the cost of production, fought back. Nixon struck a compromise, allowing prices to fall to satisfy the grain exporters, while promising farmers direct payments from the government to cover their losses. The administration set the floor-price paid to farmers, or loan rate, at a very low level — the level, in fact, that the corporations advised was competitive. It then guaranteed security for farmers by setting a "target price", roughly equivalent to the costs of production. The loan rate was the price the corporations wanted, the target price was the price the farmers said they needed to survive, and the difference was made up by the taxpayer in the form of direct payments to farmers, called "deficiency payments". It was a cunning policy, because these payments appeared to be direct subsidies to farmers; but the purpose of the payments was to support farmers who were selling their crops to corporations at prices far below the costs of production, which in fact meant that the real subsidies were going to agribusiness. It was, in essence, a money-laundering scheme.

During the first years of this programme, the combination of the market prices and the deficiency payments covered basic costs. But the budgetary crisis created by the Vietnam war led to cutbacks in every sector, including farm programmes. By the end of the 1970s, Congress was no longer asking how high the target price needed to be set to insure that farmers survived, but how low it needed to be set so that deficiency payments stayed within a limited budget. The combination of low prices and falling deficiency payments meant that most farmers no longer received enough income to cover their costs.

In consequence the past decade has been one of crisis for the US farmer. According to the US Department of Agriculture, the average cost of production for corn (maize) in the US has been around $3.10 per bushel, roughly $125 per tonne, over the last decade. Farmers receive $1.50 per bushel in market prices and $1.00 per bushel in deficiency payments, leaving them about $0.60 short on every bushel.[3] For many farmers, especially younger ones still buying their land and machinery, their total income is not enough to cover all costs. Many have been forced into bankruptcy and foreclosure: the US has lost nearly 30 per cent of its farmers since 1980.[4]

Some farmers have found ways to produce corn for less than the average price, but often at a high long-term cost. For example, many have taken full or part-time work outside the farm to subsidize their farming operations. The stress upon families and communities has been serious, with large increases in marital problems, spouse and child abuse, and suicides. Many farm families have stopped paying health insurance so as to reduce monthly expenses by $500 to $1,000 per month.[5]

But perhaps the most common way of reducing short-term costs of production has been to intensify production methods, by abandoning soil and water conservation practices and using greater quantities of fertilizers and pesticides. Aside from the adverse environmental effects, this intensification has created enormous surpluses, forcing the Reagan administration to impose one of the largest, most expensive and most environmentally damaging land set-aside programmes in US farm history, known as the Payment in Kind (PIK) system.

The Effects Abroad

The creation of a surplus of cheap grain to sell on the international market was, of course, one of the main objectives of the agribusiness lobby. Agribusiness economists convinced Congress that lower prices would "drive other exporting countries out of the world market." Former Senator Boschwitz, a ranking Republican on the Agriculture Committee, stated this as an explicit goal: "If we do not act to discourage these countries now, our worldwide competitive position will continue to slide and be much more difficult to regain. This should be one of our foremost goals of our agricultural policy and the Farm Bill."[6] Economists promised a huge growth in export volume, enough to offset losses due to low prices.

Contrary to the computer projections, although the volume of exports rose, lower prices meant that their value fell from the late 1970s level of $40 billion per year to less than $30 billion by 1985.[7] In constant dollars, farm exports in 1990 reached only half the 1981 level, even though the number of bushels shipped was higher. This low price/high volume policy required a significant increase in US imports of oil, fertilizer, tyres and machinery imports, all of which became more costly over the same period, ultimately increasing the trade deficit.

The flaw in the agribusiness logic was that other countries cannot simply stop producing or exporting farm products just because the US wants them to and sets low world prices to try to drive them out of the world market. The debt servicing obligations of countries such as Brazil, Argentina and Thailand make them dependent on food exports for hard currency earnings. When the US drops its prices, other countries simply lower theirs to match, or try to boost the volume of their exports in hopes of making up for the lower prices.

Great as the costs have been for US farmers and taxpayers, the costs to the rest of the world have been just as high. Confronted with extremely low priced grain imports in their local markets, making it impossible for them to sell their own crops at a profit, many Third World farms have been wiped out as a direct result of these deficiency payment programmes. Deficiency payment schemes have been described as "death warrants" for Third World farmers.

The European Community, similarly, has kept pace with the US by creating its own agricultural surpluses, through a system of price support mechanisms. Within the framework of the current GATT negotiations, multinational grain corporations have persuaded the EC Commission, under Ray MacSharry, to switch to a deficiency payment programme similar to that used in the US. It is reasonable to expect that the scenario that unfolded in the US will be repeated in Europe. The combination of prices and payments will be tolerated for a few years, and then budget cuts will be used to reduce payments, bankrupting many of Europe's struggling farmers. The eventual human, environmental, and budgetary costs of the MacSharry proposals, both in Europe and in the Third World, are incalculable.

Reaction to Free Market Farm Policies

Reagan's free market policies in the US were not introduced without resistance. Farmers and small-town residents blocked foreclosure auctions and occupied government offices and banks. In 1984 and 1986, voters threw out numerous incumbent Senators and Representatives, including Republican Senators in the farm states of Iowa, North Dakota, South Dakota, Georgia, and Illinois. Rural America demanded an end to the destruction of their farms, families, livelihoods and communities.

The protests came not only from farmers and small town residents. Consumer and environmental groups began to express concern over the safety of food and the ecological impact

of chemical- and energy-intensive production methods being encouraged by free market policies. The National Toxics Campaign, for example, launched a nationwide campaign to introduce farm programmes which would set farm prices at levels equal to the full cost of production, including all the environmental costs, while limiting production to the amount needed to balance supply with demand.[8] A number of family farm groups and rural citizens' organizations also advocated this approach, as a way to restore economic vitality to rural America.

Agrochemical companies began to fear that many of these new proposals could lead to stricter pesticide regulations. Laws were passed that greatly increased companies' financial liability for harm done to workers, farmers and communities through the manufacture, storage or application of their products. To avoid these regulations and liabilities, many chemical companies began to move the production of the most dangerous products overseas. Corporate farm operators also moved abroad their most chemical- and labour-intensive operations, such as cotton, fruit and vegetables.

Reacting to this sharp increase in overseas production of US food supplies, a number of states and the federal government imposed progressively stricter pesticide residue regulations on imported foods. By 1989, as much as 40 per cent of imported food items inspected by the Food and Drug Administration (FDA) were rejected for reasons of unsafe chemical residues, contamination levels or other violations of US standards.[9] However, due to budget cuts, the FDA now inspects only two per cent of all the imports. This has prompted a number of states, including California, Minnesota and Wisconsin, to implement additional food safety regulations at the state-level in response to intense consumer lobbying.

Countering the Backlash

Agricultural corporations feared that a political backlash might result in Reagan's free trade legislation being dismantled, especially if a Democrat were elected to the White House. They therefore began to explore ways to prevent this happening. The strategy they devised was to move policy-making on these issues out of the hands of state legislatures and Congress, and into the arena of international trade negotiations.

In US trade policy, the government executive has the opportunity to overrule Congress and pre-empt local and state governments. Trade negotiations, for example, are conducted in secret by the White House. It is extremely difficult, even for most members of Congress, to get information about what is being negotiated until it is too late to analyse implications or to affect the outcome. Furthermore, special rules govern the approval of trade agreements. Under the "fast track" approval process, Congress cannot amend in any way the proposed agreement. Time for debate is very limited. Congress can only rubber-stamp the final text, either "Yes" or "No".[10]

In this legislative context, social and environmental regulations in the form of farm policy reforms or food safety standards could be termed "trade barriers" and then dismantled under the guise of "liberalizing trade". New rules for international trade could even roll back pesticide and other environmental regulations, while prohibiting restrictions on imported foods. Agribusiness companies have therefore joined with other business interests, such as financial services, drug and chemical companies, and computer manufacturers, in pressuring the Reagan administration to spearhead an international drive to deregulate trade.

The principal global framework for trade negotiations is the General Agreement on Tariffs and Trade (GATT). This worldwide agreement, which more than 100 countries have signed, was drafted in 1947 with a brief to establish rules for the conduct of international trade. There is currently an effort to re-write these rules as part of the Uruguay Round, named after the country where these talks were launched in 1986.

One of the most important features of the Uruguay Round proposals is the demand that nations should no longer be able to limit the volume of agricultural or other raw material imports. Existing import quotas should be subjected to a process called "tariffication," in which import controls are converted into import taxes, called tariffs, and then phased down or out within five to ten years. This would be a disaster for sustainable agriculture in both the poor countries of the South and in the North.

If accepted, this proposal would alter the rules governing world trade in food, natural fibres, fish and forestry products and would seriously limit the right of GATT member nations to implement a wide range of natural resource protection laws at local, provincial and national levels.[11] Many poor countries now use import controls, often in the form of quotas, to protect their local agriculture and fisheries from being wiped out by cheap imports from industrialized countries such as Australia, Canada, the US or Europe. If these countries are prohibited from imposing import quotas, their own local farmers will be forced to use ever more intensive and environmentally damaging methods of production in an attempt to survive. Those farmers who are not able to intensify will eventually be pushed off their land, leading to the consolidation of smallholdings into huge corporate-style farms. This is exactly what has been occurring in the US with the support and encouragement of the Department of Agriculture over the last 20 years.

US-Canada Free Trade Negotiations

Aside from the GATT negotiations, the US has been involved in various bilateral trade talks. The first of these to promote extensively the free trade agenda of agribusiness were those between the US and Canada, concluded in 1989. The agreement opened the US-Canada border to greatly increased shipments by multinational food companies in both directions. The talks were used to weaken or repeal food safety and farm security laws, opposed by agribusinesses on both sides of the border.[12] Canada, for example, had to loosen its stricter regulations on pesticides and food irradiation. And there have been moves to weaken the Canadian Wheat Board and to alter drastically the system of supply management used to protect Canadian family farmers in the poultry, egg and dairy business.

Besides blocking efforts to achieve a more sustainable agricultural system, the US-Canada agreement was a setback for environmental protection in general. It almost eliminated Canadian government spending on ecological efforts such as wetlands protection and forest replanting. These types of government subsidies were labelled "trade distorting" and essentially banned. In fact, only two types of government subsidies are allowed under the US-Canada deal: to help expand oil and gas exploration, and to subsidize companies and factories producing military weapons.[13] The US is guaranteed long-term,

low-cost access to Canadian oil, gas and uranium resources, encouraging continued dependency on non-renewable fuels.

Among the wide range of environmental protection measures that have been challenged as unfair trade barriers are US laws banning asbestos, Canadian rules to protect ocean fishery stocks from depletion, state-level laws in the US to encourage small-scale factories through tax incentives, and requirements that newsprint must contain recycled paper. In each case, the challenging country considered that the social or environmental policy of the other country placed their own domestic industry at a competitive disadvantage.

An important lesson to be learned from the US-Canada Free Trade Agreement is that there were negative effects for family farmers and the environment on both sides of the border. Deregulated trade is not an equation that benefits one country or the other, according to the skill of their respective negotiators. On the contrary, both countries pursue the interests of their transnational corporations rather than the interests of the general public. The US-Canadian deal is a good example of how family farmers, consumers and the environment on both sides of the border can lose under "free trade."

Liba Taylor/Panos

Harvesting corn by hand in Oaxaca, Mexico. Farmers such as this are likely to be put out of business by machine-harvested corn from the USA.

The NAFTA Agreement

But for the agribusiness and agrochemical countries that pushed it through, the US-Canada Free Trade Agreement did not go far enough. Almost before the ink was dry, the very same corporations began to pursue the extension of the trade agreement to Mexico. This they see as the next step in their plan for a free trade zone encompassing the whole of the Western hemisphere, the "Enterprise of the Americas Initiative."[14]

There are two main threats to sustainable agriculture in the North American Free Trade Agreement (NAFTA). The first is the stated objective of increasing the "scale of production."[15] A number of specific provisions in the text will lead to both increased corporate concentration in the processing sector and the further expansion of large scale "factory farms" in all three countries.[16]

The second is the stated goal of eliminating each government's ability to regulate the importing and exporting of goods. If local, state and national governments can no longer regulate the flow of goods across their borders, as a result of the NAFTA talks, farmers, consumers, workers and the environment will suffer.

The pursuit of these objectives will have grave effects for farmers in Mexico. One of the major demands of the multinational grain companies based in the US is unlimited access for their exports of corn and other grains to Mexico. At present, almost three million Mexican peasants grow corn and sell it at price levels set high enough by the government to ensure that they have enough cash income to survive. This system requires that the Mexican government regulate imports very carefully so that this price level is not undermined.

Economists in both Mexico and the US predict that if the grain companies are successful in their efforts to force open the Mexican corn market, the price paid to Mexican peasants will fall dramatically, forcing one million or more families off their land. Most of these families have worked at some time in the United States, so it is assumed that many will head north in search of either farmworker jobs in the countryside or service sector work in the major cities. Others will move to Mexico's urban areas, such as Mexico City and Guadalajara, already dangerously polluted.

Destroying Family Farms in the US

The United States, too, has used import regulations to sustain a domestic agricultural sector. For example, Congress has established strict controls on the level of beef imports allowed into the country in the Meat Import Act of 1979. But fast-food hamburger retailers have pushed the Bush Administration hard to make sure that any NAFTA agreement will abolish or weaken these controls, allowing them to import more hamburger meat. Since beef can be produced cheaper on cleared rainforest land in southern Mexico, a sharp increase in US beef imports from this region would cause an acceleration in the destruction of the rainforest. Mexico has also started to trans-ship beef raised on destroyed rainforest regions in Central and South America.[17]

Unlimited beef imports would also lower the income of family-sized cattle producers in the US, whose share of the market would be cut and who would have to sell at a lower price to compete. With more beef coming in from overseas, there would also be a smaller market for US-grown hay, corn and other feeds.

This could create serious environmental problems in parts of the United States, quite apart from those affecting Mexico's rainforests. The state of Minnesota, for example, has generally poor soil in the northern region, often hilly with a thin topsoil. The only agriculture production suited for this land, and indeed needed to maintain it, is beef and dairy cattle grazing. If Minnesota's diversified, family beef operations were put out of business by imports from Mexico, the fragile land would most likely be put into row crops, soya beans or corn. On these hillsides, such crops would cause the topsoil to wash away at a non-sustainable rate, destroying the productivity of the land.

The US meat-packing industry is also looking to Mexico for lower wages, weaker occupational health regulations and less

IATP

An example of cross-border co-operation, rather than competition. Members of the Mexican National Union of Regional Farmers' Organizations and the Kansas Farmer's Union meet at the border to accompany farm equipment bought by the Mexicans in Kansas. The trip was organized by the Institute for Agriculture and Trade Policy.

strict environmental standards. Cargill Corporation, for example, has already relocated part of its meat-packing operations to Mexico in anticipation of the North American Free Trade Agreement. Over time, cattle and hog production will move closer to these meat-packing facilities, since livestock cannot be shipped over long distances without serious loss. Again, workers, their communities and the environment will suffer.

US fruit and vegetable production is also threatened by the agreement. US producers currently operate under substantial regulations concerning chemicals and worker rights. They pay higher taxes and extend more worker benefits than producers in Mexico. Even if US and Mexican produce growers had the same pesticide regulations on paper, there is little chance that violators of food safety regulations would be caught, because the Food and Drug Administration inspects only two per cent of the food coming across the border. Consumer confidence could be seriously damaged by a few isolated incidents of poisoning.

As well as weaker environmental laws, low wages give Mexico a competitive advantage. Edward Angstead, president of the Growers and Shippers Association of Central California, estimates the cost of farm labour in Mexico at $3 per day, compared with $5-15 per hour in California — an attractive proposition for many companies. Pillsbury Company's Green Giant division, for example, is moving a frozen-food packing factory from Watsonville, California to Mexico in anticipation of NAFTA. The company believes the agreement will allow it to bring cheaper products formerly produced in Watsonville back into the US without tariffs and with few food safety controls.[18] The move means that the farmers in the area who grew crops for the factory will lose their market, and the farmworkers and cannery workers will lose their jobs. The impact on the community will be catastrophic.

A similar trend in the textile and clothing industry, where many factories are closing and moving to Mexico, is reducing markets for US produced cotton. Such factories are often a source of off-farm employment for many farm families, providing an extra income to supplement low farm prices. They serve as the economic backbone of many small towns, and their loss will further undermine rural communities.

Reducing Consumer Confidence

Increased food trade between the US, Mexico and Canada is likely to reduce consumer confidence in the safety and quality of food. Food processors will need to over-process, over-package and alter their produce genetically, for it to survive long trips and periods of storage. Quality, taste and nutritional value will be diminished. In the absence of uniform food-safety laws or country-of-origin labelling regulations, consumers cannot be sure about their food. If US farmers cannot use DDT or Alar while imports with residues of these chemicals are allowed, their competitiveness will be threatened, forcing them to support a weakening of domestic standards. On the other hand, efforts to "harmonize" such regulations under the auspices of the free trade agreement are likely to be simply an underhand attempt to weaken them.

For example, some Mexican milk now comes from cows treated with Bovine Growth Hormone (BGH), a milk-production drug banned in Minnesota and Wisconsin in response to consumers' and dairy farmers' demands. US consumers have expressed their grave concerns about this product's potential human health effects, especially when they found out that experimental milk from BGH test-herds here in the US was being mixed with commercial milk. Over a dozen surveys have shown that consumers will buy fewer dairy products when there is a chance that they might contain BGH.[19] US dairy farmers face a potential loss of markets and lower prices if Mexican milk containing BGH is allowed into the country.

This erosion of consumer confidence has already occurred as a result of the US-Canada Free Trade Agreement: evidence of serious problems posed by the lack of proper regulations for the inspection of imported meat set off a storm of publicity which increased consumer fears about the safety of meat. At a time when cooperation is needed to solve major environmental problems, the NAFTA appears to be creating new conflicts between farmers, environmentalists and consumers.

At the same time organic farmers on both sides of the border are under threat. In the US, the general lowering of prices on commercially grown fruits and vegetables will make it hard to charge the prices needed to cover organic growers' additional costs. Meanwhile, expansion of fruit and vegetable production in Mexico will increase the overall use of chemicals, further disrupting natural pest-control patterns. Organic farmers cannot use pesticides to control pests driven to their fields by their neighbours' spray. Since they are dependent on natural predators for their own biological pest management, any increase in chemical spraying on neighbouring farms will disrupt their efforts to use biological pest management.

Long-term Environmental Impact

The US-Mexico-Canada free trade proposal is likely to have a serious long-term impact upon the environment. In three respects it will lead to increased petroleum use, adding more carbon dioxide to the atmosphere and therefore increasing global warming. First, food products will be transported over even longer distances. US food already travels an average of 2,000 kilometres before it is consumed.[20] Second, more energy will be required to process and package foods for long-distance shipping and long-term storage. And third, farmers will intensify their production methods to boost yields in response to lower prices, leading to increased use of petrochemical fertilizers and pesticides, and petroleum-fuelled machinery.

The US, Mexican and Canadian governments have begun laying plans for accommodating the sharp increase in truck and rail shipping that they believe will take place under the free trade agreement. Some of their plans could significantly raise the costs of farming. At a meeting of transportation ministers from all three countries, for example, former US Secretary of Transportation Samuel Skinner praised Mexico's recent encouragement of private ownership of formerly public roads. Calling toll-roads "the way of the future", Skinner predicted that they would become more common in the US too, substantially raising the cost of transporting food products and causing an added burden for the farmers.

There is also a threat to biodiversity. In an overview of environmental dangers posed by NAFTA, the US National Wildlife Federation (NWF) highlighted the dangers to nature conservation and genetic diversity.[21] Modern agricultural production depends on the continued evolution of crop varieties that not only yield high output but also resist diseases, pests and drought. NWF warns that free trade could threaten the survival of diverse genetic resource pools, leaving society without the genetic raw materials needed to protect our food security.

Towards Sustainable Trade

Agriculture is the main human activity on Earth and the principal influence on our planet's ecology. Over half the inhabitants of our planet are farmers. But since the Second World War, world market forces have turned much of agriculture upside-down — changing it from a life-giving activity to a life-threatening one. DDT sprayed in Mexico shows up in Canadian fish. Destroying rainforests to produce beef eliminates habitat for thousands of endangered species. More than 80 per cent of the water in many desert regions, including California and Saudi Arabia, is used for agriculture. By consciously driving down crop prices, agribusiness has driven 27 million US farmers off the land since 1940,[22] forcing the four million who are left to become increasingly dependent on poisonous chemicals and giant machinery. Overcrowded cities, polluted water supplies, and overburdened tax systems are among the many serious by-products of this massive dislocation.

The current debates surrounding both the GATT and the NAFTA offer a unique opportunity to begin addressing these problems. In order to regenerate a sustainable, family-based system of agriculture, it is necessary to defeat the concept of global deregulation and the "new world order" currently being promoted by the Bush Administration. However we must go beyond mere opposition, and forge a positive vision for economic, political and trading relations among nations. A positive "trade and development agreement" would address the problems caused by varying food-safety standards; it would set minimum standards or "floors" for regulations, rather than the "ceilings" proposed by the Bush Administration; it would outlaw the dumping of goods by US and European corporations; and it would ensure that the full costs of production, including environmental costs, are considered in the setting of farm prices. If these things are not done, we will almost certainly find one day that global food stocks are no longer sufficient to handle the emergencies which will inevitably occur.

As a consensus evolves, we must organize to turn these ideas into policies. Agriculture groups from the US must work with their colleagues from around the world to establish a common set of basic demands and solutions. This common agenda must then be promoted aggressively to all governments and to the public. The controversy and debate created by the current trade negotiations must provide the momentum for establishing new and more just relations among all nations. The survival of future generations depends upon our success today at achieving a sustainable agriculture, that in Wendell Berry's words, "depletes neither the people nor the land".

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Tritium
The Overlooked Nuclear Hazard

by
Ian Fairlie

More tritium is released from nuclear installations than any other radioactive contaminant. The nuclear industry insists that such releases, which are largely unregulated, pose no risks to the public; but the models used to assess its radiotoxicity are suspect, and there is mounting evidence linking tritium emissions with birth defects and cancers.

Although tritium, a radioactive form of hydrogen, occurs in nature — formed by the action of cosmic rays on the earth's atmosphere — nuclear installations are by far the greatest source of tritium in the environment. Emissions from civil nuclear reactors, reprocessing and storage facilities in Western industrialized countries now equal natural sources[1] — approximately 7.4×10^4 terabecquerels per year[2] (TBq/a), one terabecquerel being 10^{12} becquerels. Still larger quantities are released from nuclear weapons facilities: the two massive US nuclear weapons plants at Savannah River and Hanford, when they were both working, alone released ten times more than the combined emissions from all the West's civil nuclear installations — some 1.1×10^5 TBq/a.[3] Worldwide, nuclear weapons manufacturing, up until recently, released 2.8×10^6 TBq/a.[4] Testing of nuclear weapons, in particular from 1954 to 1962, released even larger amounts into the atmosphere — a report[5] by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) put the figure for 1977 at 1.6×10^8 TBq.

In the UK, the largest tritium emissions to atmosphere are from the Chapelcross plant in Dumfriesshire, Scotland, which makes tritium for nuclear weapons. Other major sources are the Sellafield reprocessing plant in Cumbria, and other nuclear weapons and production facilities. The table opposite shows these facilities ranked according to the volume of atmospheric emissions.

If nuclear fusion is ever developed commercially, it is expected that tritium discharges will increase considerably, since the core of each fusion reactor will contain an estimated 10 kilogrammes (100 million curies) of tritium.[6] Should the lithium, also used in the reactor, catch fire and burn with sufficient intensity, a substantial fraction of the reactor's tritium could be released. It has been estimated that for every 1,000 megawatts of future fusion capacity, 110 TBq/a of tritium will be released into the environment in the form of "routine" discharges.[7] "Accidental" releases could add a further 3.7×10^4 TBq/a.[8]

In Britain, atmospheric emissions of tritium from most nuclear power stations are neither monitored nor limited (current figures for releases being estimates). It is expected, however, that limits will be imposed under revised authorizations to be issued by the Ministry of Agriculture Fisheries and Food (MAFF) and the Department of the Environment (DoE). Such atmospheric releases are more hazardous than tritium discharges to the sea, which are currently monitored and subject to limits, because airborne tritium is more readily incorporated into the human food chain, and can be directly inhaled and absorbed through the skin.

Hard to Detect

All nuclear reactors produce tritium in their fuel elements as a by-product of the fission of uranium and plutonium. Tritium is also formed by neutron activation of deuterium, lithium and boron in the moderator, coolant and control rods. With Magnox reactors and Advanced Gas Reactors (AGRs), the main activation source is lithium impurities in the graphite moderators.

Tritium does not readily diffuse through the magnox and zircalloy fuel cladding of Magnox and Pressurized Water Reactors (PWRs), whereas it diffuses easily through the stainless steel cladding of AGRs. Consequently, the tritium formed in AGRs is released on site, while that formed in Magnoxes and PWRs is not released until their fuel elements are reprocessed. Larger amounts of tritium are therefore emitted from AGRs than from other reactors in Britain.

Discharges of tritium from nuclear plants occur mainly in two forms: tritium gas (HT) and tritiated water (HTO). In its elemental form (HT), tritium is invisible, odourless and pervasive, permeating most materials, including rubber and most grades of steel, with relative ease. Tritiated gas is converted to tritiated water in dry indoor conditions at the rate of about one per cent per hour, faster in humid conditions.[9] Tritiated water is more hazardous than HT, since, being chemically identical to ordinary water, it diffuses rapidly throughout the hydrosphere and biosphere. All people living downwind of large nuclear facilities can thus be expected to be tritiated to ambient HTO levels. HTO is considered by the International Commission on Radiological Protection (ICRP) to be 25,000 times more hazardous in air than HT, because of its mobility and uptake.[10]

Because of its low energy, tritium's beta radiation is difficult to detect in air without expensive US-made equipment, not widely used in the UK. *In situ*, it is impossible to detect in air with most hand-held portable instruments, and all thermoluminescent dosemeters, film-badges or other personal dosemeters. Separating, detecting and measuring environmental concentrations of organically-bound

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tritium in food or in our bodies is even more difficult, and requires expensive, dedicated equipment and/or techniques not normally used outside specialist labs.

Faulty Dosimetry?

Nuclear authorities insist that tritium is not hazardous: indeed its releases are either not discussed in official UK reports on radioactive discharges, or are relegated to brief discussion in appendices. So how radiotoxic is tritium?

To answer this, one has to calculate the internal doses received from tritium inhaled, or absorbed through the skin, or ingested as tritiated food or tritiated water. The dosimetry of internally deposited radionuclides from concentrations released to the environment is complex. Environmental transport models have to be used to estimate tritium concentrations to which the public is exposed. Biokinetic models are then used to estimate the body's uptake, retention and excretion of tritium. From these concentrations absorbed doses can be calculated, which in turn are converted to equivalent doses so that different kinds of radiations can be measured on a common scale, a Radiation Weighting Factor, or Q factor.

These transport and biokinetic models may involve unproven assumptions and the Q factor chosen for tritium is subject to strong differences of view. Most importantly, the above models ignore the ingestion and uptake of organically-bound tritium (see below p.230). As a result, the real level of tritium doses near nuclear facilities is likely to be significantly underestimated

Political considerations have played a large part in the setting of standards. In 1963, for example, the ICRP[11] assigned a Q factor for tritium of 1.7, but in 1969 reduced it to 1.0.[12] This was despite evidence, even then, suggesting that tritium was more harmful than previously thought.[13] Dr. Karl Morgan, past chair of one of the main committees of the ICRP, recently stated that in the 1950s and 1960s, during which he was a full member of the ICRP, "there was constant pressure to set the RBE [Relative Biological Effectiveness, a scale similar to Q value] at 1.0 instead of 1.7." He added: "One ICRP member even went so far as to lament the difficulties they were having in keeping down to the tritium Maximum Permissible Concentrations (MPC) in their weapons production plant, and our lowering the RBE to one would be a great help . . . Thus the way of reducing risk in a weapons production plant has been to get the ICRP and the US National Council on Radiation Protection (NCRP) to relax radiation protection standards, raise the MPC values, and have them adopted by the US Department of Energy and the US Nuclear Regulatory Commission."[14] Since then, many other scientists[15] have questioned the wisdom of setting the low Q value of 1.0 for tritium, in view of various studies which suggest that tritium has Q values four to five times higher than the value of 1.0 still used by the ICRP.

Tritium Emissions from UK Nuclear Plants

NUCLEAR FACILITY	TRITIATED WATER VAPOUR ADMISSIONS TO ATMOSPHERE TBq/a*	TRITIATED WATER DISCHARGES TO SEA TBq/a
Chapelcross[1]	1900	0.28
Sellafield[1]	593	1699
Amersham Int'l (Cardiff Plant)	180[2]	601[3]
AWRE Aldermaston[4]	100	0.1
AERE Harwell	46[1]	1.8[4]
UKAEA Dounreay[5]	18	9.9
Amersham Int'l (Amersham Plant)	14[2]	6[3]
Wylfa Magnox	13[2]	3[3]
UKAEA Winfrith	8.4[2]	149[3]
Hunterston B AGR	8.2	333[3]
Dungeness B AGR	3.2[5]	7.3[6]
Hartlepool AGR	3.2[5]	166[6]
Heysham 1 AGR	3.2[5]	95[3]

*One TBq/a = 27 curies.

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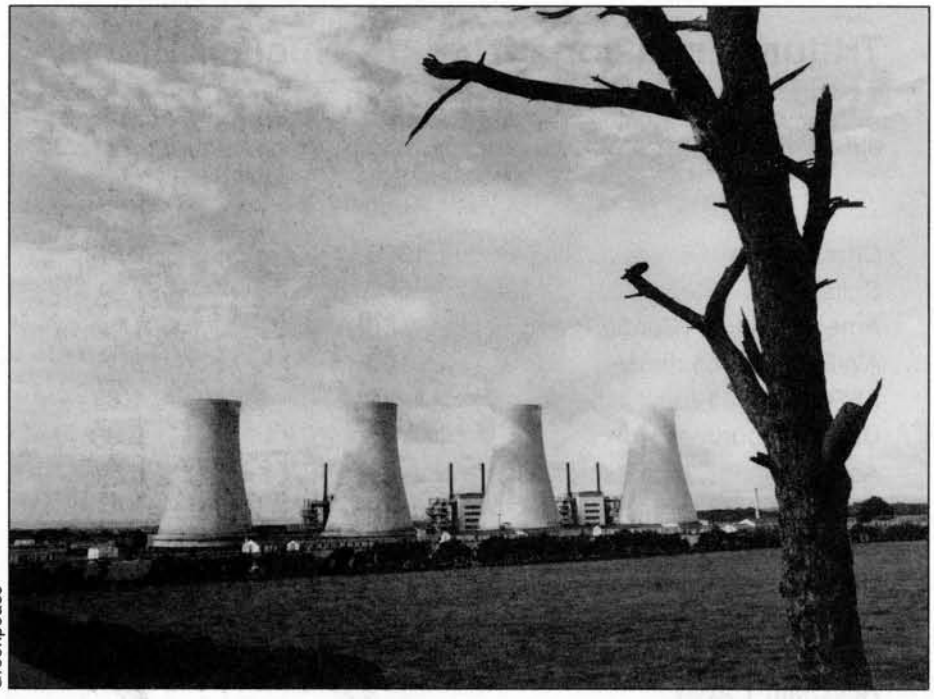
The "Weak" Radionuclide

Tritium's beta emissions are weak, indeed they are unable to penetrate intact human skin. But this relative weakness outside the body is reversed when tritium is inhaled, ingested or absorbed into the body.

For example, when tritium is incorporated into chromosomes in cell nuclei, it deposits all its energy within the chromosome because the electron emitted by tritium's decay has a short range of about 0.6 micrometres, less than the width of a human chromosome. Tritium's very "weakness" is thus the source of its danger, since its low energy and short track result in considerable damage to the DNA macromolecule, the critical site for the effects of radiation. Other internally-deposited radionuclides with larger beta and gamma energies (gamma radiation having greater penetrating power than beta radiation) have much longer tracks: their effects are thus diluted throughout organs or the whole body.

Many studies[16] indicate that ingested tritium is incorporated into cell nuclei and specifically into their DNA. Nuclear magnetic resonance studies suggest it may be selectively taken up by DNA's water of hydration.[17] Other studies show that tritium from tritiated food finds its way into DNA rather than other cell nuclei



Greenpeace

Chapelcross nuclear power station, in Dumfriesshire, Scotland, emits more than three times as much tritium into the atmosphere as any other UK plant. It produces tritium for nuclear weapons.

constituents[18] and that the ingestion of tritiated protein results in "a standard nucleus containing four times more tritium in the form of nuclear proteins than in the form of water".[19] The key point here is that the ICRP and other radiation authorities make no allowance for these possible dangers to DNA in their dose conversion factors for tritium.[19]

Organically-Bound Tritium

The incorporation of tritium into DNA is the most important of several ways in which tritium may become bound to organic material. The behaviour of such organically bound tritium (OBT) is, in general, neglected by the nuclear industry.

In calculating the concentrations of tritium in the body, the ICRP uses a metabolic model of the body's uptake, retention and excretion of tritium. Unfortunately, the ICRP ignores the fact that tritium over time will bind with the body's organic molecules. It also ignores the ingestion of tritiated food. These omissions are the most serious of all the ICRP's errors, for three reasons. First, OBT delivers radiation doses for much longer periods of time than tritiated water — 280 to 550 days as compared to 10 days.[20] Second, it delivers doses to specific organs and cells rather than being diluted throughout the 40 kilograms of water in the average human body. Third, the dangers of radiation are thought to be particularly acute where rapid cell replication occurs, for example in embryos, and in sperm-producing and bone-marrow cells. Uptake of high concentrations of OBT from tritiated food by the DNA of these cells could result in birth defects, genetic effects and childhood leukemias respectively. These are the adverse health effects being reported near nuclear reactors around the world producing large amounts of tritium.

Organically-bound tritium was overlooked by radiation authorities for many years, and even now, relatively little is known about the details of OBT uptake, metabolism and excretion in humans. This situation is changing slightly; in 1989, the ICRP issued a report[21] acknowledging OBT's uptake for the first time. In 1989, the National Radiological Protection Board (NRPB) followed suit and issued dose conversion factors for OBT which gave it further recognition, but they still have not taken the next vital steps of recommending limits for OBT intake, or suggesting how to measure OBT in humans. Also, in 1990, four scientists from health research institutes in Germany, France, Sweden and the US issued a report[22] drawing attention to OBT, stating "the radiation dose delivered to specific tissues, for example bone marrow, may be greater following the ingestion of organically-bound tritium by almost an order of magnitude as compared to HTO [tritiated water]." Unfortunately, UK monitoring authorities, including MAFF, the Department of the Environment and the NRPB, still consider only tritiated water in their measurements and dose calculations, and ignore OBT.

Lax Limits

It can be seen from the above that the factors which shaped tritium's limits were determined in the late 1960s and 1970s when cold war imperatives and the need for maximum tritium production for nuclear weapons were considered more important than today. These same limits, though out of date, are still in force.

The crucial point about tritum's faulty dosimetry is that it results in annual limits for tritium which are very lax. The maximum amount of a radionuclide which a worker may safely ingest or inhale in one year is termed the Annual Limit on Intake (ALI). The ICRP now recommends an ALI for ingested tritiated water of 1×10^9 Bq/a.[23] This is the amount of tritium which, if ingested, would result in the ICRP's recommended maximum radiation dose for workers in one year. This limit is 660 times more lax (for ingestion) than that for caesium-137, and 1,000 times more lax than iodine-131, both of which are commonly discharged from nuclear sites and may be compared with tritium. Also, the Derived Generalised Limit for members of the public for tritium in green vegetables is 40 times higher than that for carbon-14 and 2,400 times than for strontium-90.[24]

Recent Reports Concerning Tritium

Several recent epidemiological studies and other reviews have added fresh evidence about tritium's toxicity, linking tritium emissions from nuclear reactors in Canada, India, the US and Britain to birth defects and possibly to cancers. Three of these studies — the findings of which are set out below — specifically discuss tritium. Several others (listed in the Box, p.231) do not single out tritium, but may be significant.

- **AECB Canada Report**

The most recent and directly relevant report is an Atomic Energy Board of Canada study[25] which analysed birth de-

fects near the Pickering nuclear station near Toronto, Ontario. The Pickering heavy water reactors emit 2,500 TBq/a of tritium, about the same amount as is emitted from Sellafield, but, and this may be important, it is the only radionuclide emitted in any quantity by the Canadian reactors. The study found an 80 per cent (Observed 24; Expected 12.9) increased birth prevalence of Down's syndrome at the nearby town of Pickering, and a 46% (Observed 14; Expected 9.6) increase at Ajax, a town further away. These were correlated with airborne tritium releases in the case of Pickering, and ground monitored tritium levels in the case of Ajax. The report also found an association between high airborne tritium release levels and central nervous system anomalies in births at Pickering.

- **The Beral Report**

In 1985, Beral conducted a mortality study[26] of 40,000 United Kingdom Atomic Energy Authority employees, some of whom were monitored for tritium exposure (but whose precise levels of tritium exposure were not recorded). The study found that the only cause of death showing a clear relation with radiation exposure was prostatic cancer and the relationship was particularly marked for those who were monitored for tritium exposure. However other workers not monitored for tritium also died from this form of cancer. The study indicated that these unmonitored cases were almost exclusively linked to the Winfrith heavy water reactor, which produced relatively large amounts of tritium.

- **The Lawrence Livermore Laboratory Report**

In 1991, the US Lawrence Livermore Laboratory, a nuclear research facility funded mostly by US nuclear agencies, comprehensively reviewed[27] the carcinogenic, mutagenic and teratogenic risks of tritium — ie. the risks for cancer, genemutation and birth defects. The report assembled RBE estimates for tritium which were judged to be 1.5 to 5 times greater than RBE estimates for gamma and X-rays. This alone raises serious doubts about the ICRP's recommended Q factor of 1.0 for tritium. Interestingly, both this laboratory and the US Oak Ridge National Laboratory have abandoned any further work with tritium, for unstated reasons.

A Common Factor in Cancer and Deformity Clusters

Several reports have appeared of adverse effects associated with nuclear facilities which discharge tritium. They do not identify tritium as a causative agent; nevertheless all of these facilities emit large amounts of tritium, and the adverse effects that they report, principally leukemias and birth defects, are similar.

- **United Kingdom**

The 1990 Gardner Report[28] found an association between externally-measured radiation doses received by nuclear workers at the Sellafield reprocessing plant and the likelihood that they would father a leukemic child. The specific cause of these leukemias is still a matter of debate in scientific circles. Nevertheless the report mentioned tritium as one of two possible internal radionuclides in workers at Sellafield. The other was plutonium, a bone-seeker which emits powerful alpha radiation in the bone marrow where white blood cells are formed. This was thought to be the link with the leukemia found near the nuclear plants. But the Gardner report appears to cast doubt on this theory, and has shifted the focus of attention from somatic to genetic effects, from bone marrow to testes, and from plutonium to tritium, as plutonium is not , at present, thought to accumulate in testes.

- **United Kingdom**

The second and third reports[29] of the Committee on Medical Aspects of Radiation in the Environment (COMARE) discuss the raised incidence of childhood leukemias near the nuclear reprocessing plant at Dounreay, and near the nuclear facilities at Harwell, Aldermaston and Burghfield. At both areas, relatively large amounts of tritium were and are routinely emitted.

- **Ontario, Canada**

From 1989 to 1991, the AECB in Canada carried out a study[30] of childhood leukemia around Ontario nuclear plants which found a 40% (Observed 40; Expected 28.5) increase in childhood leukemia deaths near the Bruce and Pickering reactors, with a 94% level of confidence.

- **Rajasthan, India**

On 2 April 1991, the UK Channel 4 TV programme "The Price of Power" revealed high levels of congenital malformations among babies born in the villages downstream and downwind of the heavy water reactors at Kota in Rajasthan.

- **Washington State, USA**

In February 1988, at the Hanford nuclear military complex in Washington State, Sever[31] reported a statistically significant association between the paternal pre-conception radiation dose to Hanford workers and neural tube birth defects in their children, ie. anencephaly and spina bifida . Sever also reported a statistically significant elevated rate of the same birth defects among the general population near the Hanford site. Hanford, which reprocesses spent fuel for nuclear weapons purposes, discharges large amounts of tritium.

- **South Carolina, USA**

The Savannah River Plant (SRP) in South Carolina contains plutonium-producing reactors, tritium-producing plants and nuclear fuel reprocessing plants, all for nuclear weapons purposes. These are now closed but the US Government is trying to restart some of these facilities. The SRP's tritium discharges in the 1970s and 1980s were massive: according to the US National Council on Radiation Protection,[32] in the 1970s the SRP emitted 24,000 TBq of tritium a year. Statistically significant findings by the 1990 US National Cancer Institute (NCI) report of adult leukemias and especially of lung cancers in the counties surrounding the plant, and unreported higher perinatal mortality statistics for Barnwell County in South Carolina.

The Future for Tritium

The associations suggested in the above health reports raise questions about tritium's dangers. This is being matched by an increasing recognition, at least in some quarters, of tritium's toxicity, especially that of organically-bound tritium. Considerable research is now being carried out into the uptake and retention of nuclides, including tritium, during pregnancy, and studies may soon be initiated into OBT concentrations near some UK nuclear facilities. These perceptions of the increased dangers of tritium may not augur well for any expansion of the UK nuclear industry. They certainly will dampen hopes that fusion would provide a non-radioactively polluting source of electricity. It may be wiser to address these newly-perceived dangers of tritium while we still have energy policy choices ahead of us, rather than face expensive nuclear cleanups and retrofits for health reasons later.

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Profiting from Cancer
Vested Interests and the Cancer Epidemic

by
Samuel S. Epstein

For years, the medical establishment in Europe and North America, in concert with industrial interests and academic representatives, has misled and confused the public by repeated claims that it is "winning the war against cancer". But despite the vast sums of money poured into cancer research, the incidence of cancers (standardized for age) has escalated to epidemic proportions, while the ability to treat and cure most cancers has hardly improved. Moreover, there has been a concerted effort to downplay the environmental and occupational causes of cancer; by highlighting almost exclusively the role of smoking and diet, the "cancer establishment" has attempted to shift the blame from industrial polluters to individual cancer victims who "have only themselves to blame". The National Cancer Institute and the American Cancer Society in the US typify the interests of this establishment which stand in the way of curbing the cancer epidemic.

In 1990, over one million US Americans were diagnosed as having cancer, and a half a million died of the disease. Cancer now strikes one in three people and kills one in four in the US, UK and most other Western industrialized countries. This compares with an incidence of one in four in the 1950s, when the mortality rate was one in five.

Since the 1950s, age-standardized cancer incidence rates in the US have increased by 43.5 per cent overall,[1] the rates for some common cancers rocketing. Between 1950 and 1988, lung cancer increased by 263 per cent, prostate cancer by 100 per cent, and female breast and male colon cancers by about 60 per cent. Rates for some less common cancers have also risen sharply: malignant melanoma (skin cancer), multiple myeloma (bone marrow cancer) and non-Hodgkin's lymphoma (cancer of the lymph glands) have increased by well over 100 per cent, while cancers of the testes and kidneys in males have doubled. Similar increases have occurred in industrialized countries besides the US. The only major declines have been for stomach and cervical cancers.

From 1975-1984, overall age-standardized mortality rates increased by 5.5 per cent — from 162 per 100,000 to 171 per 100,000. Such national averages, however, obscure significantly higher cancer mortality rates within certain groups: the death rate among those over 75 years, for example, increased by 9.0 per cent from 1212 per 100,000 to 1351 per 100,000.[2]

Some 75 per cent of all cancers develop in those over the age of 55. But there are notable exceptions, particularly some leukemias, brain cancers and cancers of the testes, which strike mainly the young and have been increasing at alarming rates. For instance, the increase in testicular cancer among men aged between 25 and 34 has increased 300 per cent since the Second World War. Cancer rates are particularly high among the lowest income groups: blacks (with an incidence approximately 10 per cent higher than whites); those living near industrial plants, mines, chemical works and nuclear installations; and workers exposed to chemical and radioactive carcinogens. The rates for certain cancers are ten times higher among some industrial workers than within the general population. In addition, rates in children of workers who handle chemical carcinogens have increased sharply: the risks of childhood leukemia are two to five times higher if there is parental exposure to spray paints, dyes or pigments during pregnancy.[3]

Smoking as Scapegoat

Yet, contrary to their own data, both the National Cancer Institute (NCI) and the American Cancer Society (ACS) have insisted — until very recently — that the incidence and mortality rates of all cancers other than those related to tobacco, are not increasing: "We are not certainly experiencing an overall epidemic of cancer, except for that attributable to cigarette smoking."[4] Similar unfounded assertions have been made by British epidemiologists such as Richard Doll who earlier this year, contrary to documented evidence, alleged that the increase in mortality from cancer "can be accounted for in all industrialized countries by the spread of cigarette smoking."[5] Yet, as a recent study points out:

> "In the USA and United Kingdom, mortality rates for lung cancer . . . have actually begun to decline in men, due in large part to reductions in smoking. Moreover, despite these reductions in lung cancer, incidence and mortality for many other types of cancer increased from 1969 to 1986 in 15 industrial countries, especially in persons over age 65. The causes of these recent increases in cancer cannot simply be explained by smoking, but appear to reflect other exposures to changing factors in the environment."[6]

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Furthermore, even assuming incorrectly that all lung cancer is due to smoking (*see* Box, p.235), about 75 per cent of the increased cancer incidence since 1950 is due to cancers in sites other than the lung.[7]

Static Cure Rates

Highly misleading claims have also been made by the NCI and the ACS with regard to improving "cure" rates for cancers (conventionally defined in terms of the number of people who survive for five years after diagnosis). In particular, the efficacy of the latest anti-cancer treatments — from cytotoxic chemotherapy to interferons and biotechnology products, such as tumour necrosis factor, monoclonal antibodies and interleukins — have been grossly overstated.

According to the NCI's own statistics, overall five-year survival rates for cancers in all ages and races improved marginally from 49.1 per cent to 51.1 per cent from 1974 to 1987 — the rates for blacks during this period actually dropped from 38.6 per cent to 38.4 per cent.[8] Even this miniscule improvement in overall "cure" rates may be little more than a statistical artifact:[9] earlier diagnosis, for example, may extend the period between *diagnosis* and death, leading to the conclusion that the patient has survived longer, when the cancer may have proved fatal regardless of when it was diagnosed. The rates ignore the many patients who are judged "cured", but die from a recurrence of the same cancer after they have passed the five-year period. This is particularly true for women with breast cancer.

Not surprisingly, the claims made by organizations such as the NCI and the ACS for advances in the ability to treat and cure cancer are meeting increasing scepticism. Five years ago, the US General Accounting Office stated:

> "For the majority of the cancers we examined, the actual improvements (in survival) have been small or have been overestimated by the published rates . . . NCI does not systematically alert readers of its annual statistics reviews to potential sources of bias that affect changes in survival rates. It is difficult to find that there has been much progress . . . (For breast cancer), there was a slight improvement . . . (which) is considerably less than reported."[10]

More recently, in 1990, a leading German biometrician concluded after a comprehensive review of the literature and a questionnaire survey of over 350 cancer specialists (oncologists) and research units worldwide that the benefits of chemotherapy for treating most (epithelial) cancers have, with the possible exception of the rare "small-cell" lung cancer, been greatly exaggerated. "Many oncologists take it for granted that response to therapy prolongs survival, an opinion which is based on a fallacy and which is not supported by clinical studies. To date there is no clear evidence that the [great majority] of treated patients . . . benefit from chemotherapy as to their quality of life;"[11] in fact quality of life is often devastated by the highly toxic treatment.

Even within the NCI, claims as to the success of cures are becoming more muted, a 1991 report admitting that, "In patients with disseminated forms of the common epithelial tumours, both complete remissions and cures continue to elude us."[12]

Causing Breast Cancer

To make matters worse, many of the "cures" and putative "prevention" programmes promoted by the NCI and ACS may actually be *causing* cancer. Over the last two decades, for example, more than $1 billion has been spent on "combatting" breast cancer.[13] According to a 1991 report by the General Office of Accounting, however, "there has been no progress in preventing the disease."[14]

NCI programmes insist that the major cause of breast cancer is a high fat diet, ignoring the considerable evidence of the role of avoidable carcinogenic dietary contaminants. These include pesticides, such as DDT, chlordane and dieldrin which concentrate in animal fats,[15] and exogenous oestrogens in animal fat, due to the unregulated use of growth-promoting hormones as additives in animal feed.[16]

Apart from adhering to such myopic science, the NCI and ACS have failed to investigate the carcinogenic hazards of mammography, particularly the relation between recently increasing breast cancer rates and the high-dose X-ray mammograms administered to some 300,000 women during the 1970s as part of the Breast Cancer Detection and Demonstration Programme (BCDDP). Based on a wide range of previously published epidemiological data, a group of international radiation specialists estimated in 1972 that breast cancer risks would be increased by approximately one per cent for every rad of exposure.[17] Thus, a pre-menopausal woman having one mammogram a year for 10 years, with a conservative estimated dose of two rads per exposure, would have a 20 per cent excess risk of contracting breast cancer. A confidential memo[18] by the senior NCI doctor in charge of the screening programme may explain why women were not alerted to this risk, in spite of warnings by the US National Academy of Sciences and by the NCI's own key scientific staff.[19] The memo, which may also account for the cancer establishment's enthusiasm for the BCDDP programme, stated:

> "Both the (ACS) and NCI will gain a great deal of favourable publicity because they are bringing research findings to the public and applying them. This will assist in obtaining more research funds for basic research and clinical research."[20]

Quite apart from cynically exposing women to needless risk, the NCI and ACS have also failed to explore adequately safe alternatives to mammography, particularly trans-illumination with infrared light scanning.[21] This is especially serious in view of several reports of excess breast cancer deaths in pre-menopausal women following repeated mammography, together with accumulating evidence of its diagnostic ineffectiveness in younger women.[22] Summarizing the findings of a recent large-scale study in Canada, for example, *The Lancet* concluded:

> "There is no evidence to support introduction of service mammography for women under 50, and some may argue that there should be a moratorium on all mammography for symptom-free women in this age group outside randomized control trials."[23]

The NCI has now embarked on a "prevention" trial which can only be described as a prospective experiment in carcinogenesis. Some 16,000 *healthy* women — deemed to be at increased risk of breast cancer for familial and other reasons, including just being aged over 60 — are to be given tamoxifen, a drug which is structurally related to the synthetic growth-promoting hormone DES. Manufactured by the giant British pharmaceutical company Imperial Chemical Industries (ICI), tamoxifen not only binds very tightly to DNA, a general character-

istic of carcinogens — making it "a poor choice for the chronic preventative treatment of breast cancer"[24] — but has been described as "a rip-roaring liver carcinogen,"[25] inducing highly malignant liver tumours in 15 per cent of rats at doses equivalent to the daily 20 milligram dose used in the trial.[26] This experimental evidence of potent carcinogenicity is confirmed by two case reports of liver cancers among 931 women receiving 40 milligram doses of tamoxifen for treatment of breast cancer.[27]

Just as strikingly, several reports of uterine cancer in women who had taken tamoxifen for treatment of breast cancer suggest that the drug increases the relative risk of this cancer 6.4 times.[28] British statistician Richard Peto dismissed this risk as "no big deal",[29] thereby attaining a new low in medical sexism. It should be emphasized further that the median follow-up for all the seven reported trials in treating breast cancer with tamoxifen was only seven-and-a-half years,[30] too short a period to assess whether these cancers will develop. As relatively few breast cancer patients have taken the drug for more than five years,[31] tamoxifen may be a much more potent human carcinogen than is currently recognized These dangers receive scant attention in the patient consent form used in the NCI "prevention" trials. On the contrary, the forms trivialize the risks and grossly exaggerate the potential benefits.[32] Alleged benefits include a reduction in osteoporosis and prevention of heart attacks, the evidence for which is, at best, highly inconsistent and tenuous. [33]

Conflicts of Interest

Cancer care is big business; annual cancer drug sales in the US total approximately $1 billion. Underlying the NCI's fixation with diagnosis, treatment and research into new drugs and other "cures" is an institutionalized alliance between interlocking professional and financial interests; the highly profitable pharmaceutical industry is at its hub.

Core members of this alliance — the "cancer establishment" — include:

- the National Cancer Institute and the powerful "philanthropic" American Cancer Society, the tail that wags the NCI dog;
- the 20 major US "cancer centres", notably New York's Memorial Sloan-Kettering cancer hospital, whose

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Causes of Lung Cancer

Smoking is indisputably a major cause of disease and death from cardiovascular disease and lung cancer, and a cause of cancers at other sites. However, the NCI has trivialized the substantial amount of evidence that links occupational and environmental causes to lung cancer including:

- The incidence of lung cancer in non-smokers has more than doubled in recent decades.
- Lung cancer rates in black men are some 40 per cent higher and have been increasing more rapidly than in whites over the last few decades. While more black men identify themselves as current smokers, they have in fact smoked less and started smoking later in life than white men.
- The incidence of adenocarcinoma of the lung, which is less clearly related to smoking than are squamous and oat-cell carcinomas, has increased sharply over recent decades. According to the most recent data (1983-1987), 26.5 per cent of all lung cancer in whites is due to adenocarcinomas and 32.4 per cent in blacks.
- The role of occupation as a major confounding variable in lung cancer statistics was ignored in nearly all of the 30 retrospective studies associating lung cancer with smoking.
- There are strong positive associations — largely independent of smoking habits — between lung cancer and exposure to carcinogens in the workplace. Such occupational carcinogens include arsenic, chrome, nickel and BCME (bischloromethylether, a chemical used in the production of resins). There are also strong links between lung cancer rates and industrial processes such as copper smelting, uranium mining, zinc and lead mining, spray painting, and tanning. The high lung cancer rates in workers in casting areas of iron foundries, for example, are related to their daily exposure to polycyclic aromatic hydrocarbons (PAHs) — the carcinogenic by-products of the incomplete combustion of organic materials. It is estimated that workers in such foundries inhale daily levels of PAHs equivalent to smoking 10-20 packs of cigarettes.
- Since 1970, when the National Panel of Consultants on the Conquest of Cancer concluded that "lung cancer (is) undoubtedly attributable to the air pollution in certain environments", a number of studies, including those on diesel exhaust, have incriminated air pollution as a significant cause of lung cancer. Other studies have demonstrated unusually high lung cancer rates in communities residing near large petrochemical plants.
- Age-adjusted lung cancer death rates which cannot be attributed to smoking have been recently computed from published data on the proportion of lung cancer victims who were active smokers, the proportion who were ex-smokers, and the amounts smoked. The study found that 13 per cent of lung cancers in white men could not be attributed to smoking. For black women, the figure was 28 per cent. Lung cancer deaths which could not be attributed to smoking were 67 per cent higher in black than white men and 16 per cent higher in black women than white women. The study concluded: "These residual rates place non-smoking attributable lung cancers among the three or four most common cancers (in terms of mortality) in the US."

annual budget exceeds $350 million, and Boston's Dana-Farber Cancer Institute;

- university departments and staff under contract to the NCI and the ACS or receiving grants from them;
- and major pharmaceutical companies.

Multiple connections between this cancer establishment and chemical, pharmaceutical and biotechnology companies have spawned "the drug-development industrial complex". For example, Bristol-Myers Squibb, the largest chemotherapy drug producer in the US, controls key positions on Sloan-Kettering's board. Other board members have close affiliations with oil, steel and other large corporations. Likewise the Dana-Farber Cancer Institute has close connections with Sandoz Pharma Ltd, a huge pharmaceutical company which recently signed a $100 million cancer drug development deal with the Institute. Furthermore, a "revolving door" operates between the NCI, the major cancer centres and the drug companies. For example, Stephen Carter, head of drug research and development at Bristol-Myers Squibb, is a former director of NCI's Division of Cancer Treatment.[34]

A still more obvious conflict of interest relates to the three-member executive Cancer Panel which controls NCI priorities and policies. The panel is appointed by the US President under the terms of the 1971 National Cancer Act.[35] Of its past chairs, the longest serving was Benno Schmidt, an investment banker, senior drug company executive, and member of the Board of Overseers of the Memorial Sloan-Kettering. He was followed by the late Armand Hammer, chair of Occidental Petroleum, the company responsible for Love Canal and numerous other pollution disasters, and a major manufacturer of carcinogenic chemicals.

Such conflicts of interest explain to a large extent why treatment, not prevention, has been and still is the cancer establishment's overwhelming priority. Of a $2 billion budget in 1992, NCI claims to have allocated about $645 million or 30 per cent to "cancer prevention", of which the Division of Cancer Etiology (DCE) received about 82 per cent and the Division of Cancer Prevention and Control (DCPC) the remainder. Included in the "cancer prevention" budget was an allocation of some $335 million — 17 per cent of the total budget — for "primary cancer prevention". But only minimal funding — $50 million at most — has apparently been awarded for research and interventions into avoidable carcinogens in air, water, food, home and the workplace (with the exception of wide-ranging smoking prevention programmes); only one per cent of the overall $2 billion budget is earmarked for research into occupational cancer. No significant funding seems to have been given for efforts to reduce such avoidable exposures.

Moreover, it is clear that the NCI has no intention of making any substantial changes in its policies and priorities. The NCI's 1993 "bypass" budget, which is presented directly to the US president, totals $2.7 billion, in which $204 million is allocated for DCPC for the expansion of current prevention programmes, but still with no reference whatsoever to research and interventions relating to occupational causes of cancer and other avoidable exposures to environmental carcinogens.[36] Neither the NCI nor the ACS have ever provided testimony or guidance to Congress or regulatory agencies on regulating such causes and avoiding such exposures.

Cancer, Lifestyle and the Environment

NCI reluctance to address the issue of environmental carcinogens typifies its "blame-the-victim" approach to the causes of cancer. In this simplistic and sometimes self-interested view, personal habits and lifestyles, not industrial interests, are held responsible for cancer: prevention concentrates on anti-smoking campaigns, for example, rather than curbing more general pollution in the workplace and the environment.

The NCI's estimates of the causes of cancer are largely based on an obsolete analysis of trends in cancer mortality from 1933-1977, entitled *The Causes of Cancer*, by "lifestyle" advocates Doll and Peto of Oxford University.[37] Even when it was published in 1981, the analysis was criticized severely by leading independent US authorities for its misleading statements on the causes of some, if not most, cancers and for its preoccupation with blaming the victims for faulty lifestyles, while trivializing or ignoring the role of avoidable exposure to industrial carcinogens in air, water, food and the workplace. The report concluded, for example, that "there is no evidence of any generalized increase (in cancer mortality) other than that due to tobacco." This conclusion was reached by excluding from the study consideration of blacks (because of the alleged unreliability of the statistics) and people over the age of 65 — the very groups in which more than half of all cancer deaths have been reported — and by incorrectly ascribing lung cancer almost exclusively to smoking. The study was also devoid of any cited quantitative scientific data, apart from that for smoking, for which the confounding variable of occupational exposures was completely ignored.

According to Doll and Peto, diet causes 35-70 per cent of cancers and smoking 30 per cent. Other causes, such as alcohol and sunlight, brought the total up to 96 per cent, leaving a balance of 4 per cent. To bring the figures neatly up to 100 per cent, they arbitrarily ascribed 4 per cent to occupational causes. This tenuous hypothesis flies in the face of evidence:

- Over the last decade, a plethora of new studies have identified numerous products and processes as carcinogenic, inducing cancers in a wide range of organs, notably the lungs, the brain, bladder, kidneys and bone marrow.[38]

- Based on exposure data, the US National Institutes of Occupational Safety and Health (NIOSH) has estimated that approximately 11 million workers are exposed to occupational carcinogens.[39]

- In late 1981, Peto backtracked and admitted that, "Occupational factors are likely to account for . . . a 'large' percentage (eg. 20-40 per cent) of all US cancer. [Even low estimates] represent large enough absolute numbers of deaths to justify both intensive research and political action . . . A mere 2.5 per cent of all US cancer deaths would represent some 10,000 deaths per year."[40]

- Of 37,000 cancer deaths each year in New York state, an estimated 10 per cent are due to occupational exposures.[41] The same percentage applied to the US as a whole gives an annual mortality rate of 50,000.

- The relative risks of workers contracting cancer in specific organs following exposures to occupational carcinogens, such as aromatic amines, industrial antioxidants used particularly in the rubber industry, benzene and BCME (bischloromethylether), are ten-fold or more greater than the risks for the general population.

- By the year 2030, it is estimated that asbestos — the single most important known occupational carcinogen — will have caused some 300,000 cancer and other deaths, including 60,000 non-smoking related mesotheliomas (cancers of the chest or abdominal linings).[42] Such estimates negate the continuing assertions by Doll, on whom the NCI still unaccountably relies, that asbestos is responsible for only a "few cases of mesothelioma".[43]

- Over 20 US and international studies have identified parental exposure to occupational carcinogens as a major cause of childhood cancer,[44] the incidence of which has increased by 21 per cent since 1950.

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An estimated 6,000 children, now of pre-school age, will develop cancer later in life from exposure to residues of carcinogenic pesticides in fruits and vegetables, if current exposure levels continue.[46]

Pesticides and Cancer

That environmental pollution is a major cause of the increasing incidence of cancer is illustrated by reference to just one class of industrial chemicals — carcinogenic pesticides.

Some 53 carcinogenic pesticides are registered for use in the US on major crops, such as apples, tomatoes and potatoes. Consumption of common foods with residues of 28 of these pesticides have been conservatively associated with some 20,000 excess cancer deaths a year.[45] The US Environmental Protection Agency (EPA) allows residues of a single carcinogenic pesticide on a single food item at levels posing a "negligible cancer risk" of 1/100,000 excess cancers, equivalent to some 35 excess cancer deaths a year. However, on the basis of the EPA's own estimates, the aggregate realistic risks from consuming about 30 items on a plateful of food contaminated by residues of some 30 carcinogenic pesticides would

result in about 30,000 excess cancers each year, assuming (conservatively) that risks are simply additive rather than synergistic.[47] It should be stressed further that NCI has not undertaken epidemiological studies on the majority of pesticides known — in some instances for decades — to induce cancer in experimental animals. In July 1992, the NCI announced a joint programme with industry — "Five-a-day Food for Better Health" — to promote foods considered to prevent cancer: yet the extensive contamination of such food with detectable (but unlabelled) residues of carcinogenic pesticides was ignored. A recent EPA report reveals that pesticide residues present in food, including carcinogens, may exceed published standards by a factor of more than 10,000.[48]

Some 34 pesticides are commonly used for professional lawn care treatment at application rates over five times more than in agricultural use; ten of these pesticides are known to induce cancer in rodents.[49] One of these herbicides, 2,4-D, a major component of Agent Orange, has been confirmed as a human carcinogen in occupational studies undertaken by NCI.[50] Recent studies have also demonstrated major excesses of lymphomas in dogs living in homes where the gardens receive regular lawn care treatment.[51] Infants and children are clearly at major excess risk from such exposures.

Over the last three decades, millions of US homes have been treated for termites by subterranean application of heptachlor and chlordane, two slowly-degrading carcinogenic pesticides.[52] These pesticides are a complex mix of some 150 components, including undisclosed potent carcinogenic contaminants, termed "inert" by the EPA and by industry.[53] The agricultural use of these pesticides was phased out in 1975 after the EPA concluded that their residues in food posed an "imminent hazard" of cancer.[54] It was subsequently determined that routine termite treatment could result in persistent air contamination with exposure levels greater than those which EPA deemed an imminent cancer hazard on food: the resulting excess cancer risk has been minimally estimated in the order of 300-3,000 cancer deaths a year. Misapplication of these pesticides is commonplace. Despite repeated recommendations, however, no epidemiological studies have ever been conducted on the large number of people living in contaminated homes.[55] While NCI scientists have agreed, in principle, to conduct an epidemiological feasibility study on people living in chlordane-contaminated homes, this has not yet been undertaken.[56]

Reforming the NCI

The complex web of vested interests described above limits the feasibility of implementing drastic reforms of NCI policies which are long overdue. Additional constraints include the conscious or subconscious duplicity by the NCI leadership in attempting to persuade the public and Congress that they are winning the "war against cancer", and the historic lack of effective scientific, Congressional, grassroots and labour constituencies for primary cancer prevention.

Nonetheless, the pressure for reform is growing. A statement criticizing federal cancer policies, with particular reference to the National Cancer Institute, released in February 1992, (*see* p.239) was signed and endorsed by 68 prominent experts in industrial medicine, carcinogenesis, epidemiology and public health.

The emergence of this group of experts poses a unique opportunity to develop appropriate reforms. Of critical importance is the need for more medical, public health and other scientific professionals to endorse the statements and participate actively in the planning and implementation of future strategies. Tens of thousands of avoidable cancer deaths each year should be an adequate stimulus to abandon customary scientific reticence, and proceed instead with aggressive action programmes including media campaigns and the enrolment of support from organized labour, and from nationwide grassroots citizen groups.

Equally critical is the need for active support for Congress, particularly for those members of NCI appropriations and authorization committees who have demonstrated their concern to prioritize primary cancer prevention.

They should be encouraged to develop initiatives including:

- persuading the NCI to accept a realistic definition of primary cancer prevention, based on research and interventions designed to reduce or eliminate exposure to avoidable carcinogens in air, water, food, the home and the workplace;
- requiring NCI to submit a detailed annual report on all primary prevention programmes with abstracts and itemized budget allocation for each;
- developing appropriate mechanisms for the scientific evaluation of NCI primary prevention programmes by qualified independent experts;
- developing progressive "set-aside" appropriations, such as 10 per cent of the total budget each year, for primary prevention until they reach parity with all other NCI programmes combined, ideally within a five-year period;
- complying with the National Cancer Act requirement that at least five members of NCI's Advisory Board should be scientists with recognized authority in environmental and occupational carcinogenesis;
- requiring NCI scientists to provide expertise to Congress, Federal and regulatory agencies, and local authorities concerned with legislation and regulation of avoidable exposures to environmental and occupational carcinogens;
- and amending the National Cancer Act as follows:

"The NCI should be removed from direct Presidential authority, and reintegrated within NIH, and thus made directly responsive to the scientific community at large and the advice and consent of Congress."

Similiar criticisms should be directed at the British cancer establishment as drastic reforms are needed in the policies of the UK government, major research institutions and charities, such as the Imperial Cancer Research Fund and the Cancer Research Campaign. These policies are almost identical to those in the US. The same searching questions need to be asked concerning the trivialization of increasing cancer incidence and mortality rates, the exaggeration of success rates in treatment and cure, and the emphasis upon smoking and dietary fat in diet at the expense of avoidable occupational and environmental causes.

This is an edited version of an address given by Professor Epstein at the May 1992 meeting of the National Cancer Advisory Board, at which the President's Cancer Panel and NCI Scientific Staff were present. A complete referenced version is available from *The Ecologist.* Medical and public health professionals in the US, UK and elsewhere wishing to endorse the Statement of Proposed Reforms of the NCI are invited to contact Professor Epstein at the School of Public Health, University of Illinois at the Medical Center, PO Box 6998, Chicago, IL 60680, USA.

Proposed Reforms of the US National Cancer Institute

In February 1992, 68 experts proposed a series of radical reforms, not as a specific blueprint but as general guidelines, for redefining the mission and priorities of the NCI. Among other proposals, they recommended that:

1. The NCI must give cancer cause and prevention at least equal emphasis, in terms of budgetary and personnel resources, as its other programmes, including diagnosis, treatment and basic research. This major shift in direction should be initiated immediately and completed within the next few years.
2. A high priority for the cancer prevention programme should be a large scale and ongoing national campaign to inform and educate the media and the public, in addition to Congress, the administration and the industry, that much cancer is avoidable and due to past exposures to chemical and physical carcinogens in air, water, food and the workplace, as well as to lifestyle factors, particularly smoking.
3. The NCI should develop systematic programmes for the qualitative and quantitative characterization of carcinogens in air, water, food and the workplace, with particular emphasis on those that are avoidable. Such information should be made available to the general public, and particularly to sub-populations at high risk, by an explicit and ongoing "right to know" educational campaign.
4. The NCI should cooperate with the National Institute of Environmental Health Sciences, and other NIH institutes, in investigating and publicizing other chronic toxic effects induced by carcinogens, including reproductive, neurological, haematological and immunological diseases, besides cancer.
5. The NCI should cooperate with the National Institute for Occupational Safety and Health, and other agencies to develop large scale programmes for monitoring, surveillance and warning of occupational, ethnic, and other sub-population groups at high risk of cancer due to known past exposures to chemical or physical carcinogens.
6. In close cooperation with key regulatory agencies and industry, the NCI should initiate large-scale research programmes to develop non-carcinogenic products and processes as alternatives to those currently based on chemical and physical carcinogens. This programme should also include research on the development of economic incentives for the reduction or phase-out of the use of industrial carcinogens, coupled with economic disincentives for their continued use, especially when appropriate non-carcinogenic alternatives are available.
7. The NCI should provide expertise to Congress, federal and state regulatory and health agencies and authorities, and industry on the fundamental scientific principles of carcinogenesis including: the validity of extrapolation to humans of data from valid animal carcinogenicity tests; the data to negate the significance of valid animal carcinogenicity tests; and exposure to chemical and physical carcinogens. The NCI should stress that the key to cancer prevention is reducing or avoiding exposure to carcinogens, rather than accepting and attempting to "manage" such risk. Current administration policies are, however, based on questionable mathematical procedures of quantitative risk assessment applied to exposures to individual carcinogens, while concomitant exposures to other carcinogens in air, water, food and the workplace are ignored or discounted.
8. The NCI should provide Congress and regulatory agencies with scientific expertise necessary to the development of legislation and regulation of carcinogens. Illustrative of such need is the administration's revocation in 1988 of the 1958 Delaney amendment to the Federal Food Drug and Cosmetic Act, banning the deliberate addition to foods of any level of carcinogen. This critical law was revoked in spite of the overwhelming endorsement of its scientific validity by a succession of expert committees over the past three decades. Neither the NCI, nor others in the cancer establishment, provided any scientific evidence challenging the validity of this revocation, including its likely impact on future cancer rates.
9. The limited programmes on routine carcinogenicity testing, now under the authority of the National Toxicology Programme (NTP), should be expanded and expedited with the more active and direct involvement of the NCI.
10. The NCI should undertake large scale intramural and extramural research programs to characterize known carcinogenic exposures, both industrial and lifestyle, in terms of their estimated impact on cancer, and the practical feasibility of their avoidability or elimination within defined early periods.
11. Continued funding by the NCI of its comprehensive cancer centres should be made contingent on their developing strong community out-reach programmes in cancer cause and prevention, as opposed to their present and almost exclusive preoccupation with diagnosis and treatment.
12. With Congressional oversight and with advice from the NIH office of Scientific Integrity, the NCI should take early action to disclose information on any interlocking financial interests between its Panel, Advisory Board, advisory committees and others in the cancer establishment (including directors of comprehensive cancer centres), and major pharmaceutical companies involved in cancer drugs and therapy and other industries. The NCI should also take the necessary precautions to prevent any such future conflicts.
15. The NCI should be enjoined from making or endorsing claims for new "cancer cures" unless these are clearly validated by data on reduced mortality rates and unless they conform to standard Food and Drug Administration regulations on claims for therapeutic efficacy.

Recognizing the powerful complex of interlocking obstacles to their proposed reforms, the group concluded: "There is no conceivable likelihood that such reforms will be implemented without legislative action. The National Cancer Act should be amended explicitly to reorient the mission and priorities of the NCI to cancer cause and prevention. Compliance of the NCI should then be assured by detailed and ongoing Congressional oversight and, most critically, by House and Senate Authorization and Appropriation committees. However, only strong support by the independent scientific and public healthy communities, together with concerned grassroots citizen groups, will convince Congress and Presidential candidates of the critical and immediate need for such drastic action."

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Banking on a Flood-Free Future?

Flood mismanagement in Bangladesh

by
Peter Custers

The World Bank's multi-million dollar Flood Action Plan, which seeks to tame Bangladesh's rivers with embankments and polders, spells outright disaster and displacement for the majority of the country's landless peasants, farmers and fishers. The Plan fails to address adequately the far more destructive flooding caused by cyclones. Land and social reforms are key to mitigating the adverse impact of floods.

The floods which regularly inundate riverine Bangladesh, a country barely above sea-level, have two causes: cyclones, which hit the coastal regions, whipping up tidal surges which sweep inland especially up the river delta; and the annual swelling of the country's three main rivers, the Ganges-Padma, the Brahmaputra-Jamuna and the Meghna.[1] Both of these can cause many deaths and extensive damage to crops and property.

But there are major differences between floods from the gigantic rivers during the monsoon season of June to September and flooding caused by the cyclones which come in from the Bay of Bengal. Eighty per cent of Bangladesh is made up of the floodplains of the three major rivers and some 250 smaller rivers, a 24,000-kilometre network of water channels which links most Bangladeshi villages. Peasants living in the floodplains readily acknowledge the benefits of the annual river floods. They cover up to four-fifths of the land in shallow water, replenishing groundwater and providing silt, nutritious algae and moisture for the fields, making Bangladesh one of the most fertile regions in the world.[2] During the particularly severe 1988 river floods, millions of peasants were forced to vacate their homes temporarily, but subsequently a bumper winter rice harvest of over 15 million tons of paddy was reaped, close to the record harvest the previous year — which is not to overlook the fact that some two thousand people died, hundreds of thousands were made homeless and property was destroyed.

In contrast, the huge cyclone-driven tidal surges, reportedly eight metres high in 1991, have no beneficial effects: they sow death and devastation only, particularly along the coast. Especially vulnerable are the landless and land-poor peasants who eke out a living on *chars*, the newly-emerged land in the coastal regions and islands in the rivers, formed by the huge beds of silt and sand carried downstream and deposited by the rivers. In the particularly catastrophic cyclone of 1991, hundreds of thousands of landless people died, many because of the lack of cyclone warnings, shelters and timely disaster relief, while millions were made homeless. The total number of people who have died in more than 25 damaging cyclones which have struck Bangladesh since 1965 is difficult to assess with accuracy, but is far greater than those who have died because of the annual river floods during the same period.

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World Bank Flood Action Plan

The difference between the two kinds of floods is indicated in the Bengali language: *barsha* are the "normal beneficial floods of the rainy season", *bonna* are harmful floods of abnormal depth and timing.[3] Outsiders often fail to make this crucial distinction, as does the World Bank in its five-year Flood Action Plan. The Plan is the response of Bangladesh's foreign aid donors to the unusually excessive river floods in 1987 and 1988 which flooded two-thirds of Dhaka in 1988. After years of neglect, the French government, under President François Mitterand, appointed a team of 30 engineers to find the permanent "solution" to flood damage, while Japan, the United Nations' Development Programme (UNDP) and the US engaged their own experts to devise elaborate flood prevention and control schemes. Under the auspices of the World Bank, (which the Group of Seven (G7) countries and Bangladeshi President Hossain Mohammed Ershad asked to coordinate the various efforts), the Flood Action Plan was adopted at an international conference in December 1989 in London.[4]

The Plan's 26 sections, 11 of them considered "priority", combining the sometimes conflicting French, US, Japanese and UNDP proposals, comprise complex studies of people, rivers, land, agriculture and the environment, costing some US$150 million, and several "pilot" schemes for which construction costs are estimated at US$400-500 million. Implementation of the Plan, however, has not progressed very far due to various delays and confusions. Amid much secrecy, conflicts of interests have appeared within the Bangladeshi bureaucracy over the "institutional division of labour and authority", while foreign "expert" teams have been delayed by the finalization of the "Terms of Reference".[5] Construction of several priority projects, however, now seems to be underway.

Behind these studies and "pilot" schemes, however, is the Plan's ultimate goal: to initiate the building of high embankments along both sides of Bangladesh's three main rivers, the Ganges, Brahmaputra and Meghna. Proposed by the French, these embankments would average 4.5 metres in height, rising to a maximum of 7.4 metres, and total 3,350 to 4,000 kilometres in length. Construction costs are estimated at between US$5.2 billion and 10.1 billion, depending on whether the embankments are built two to five kilometres away from the river (lower estimate) or one kilometre from the flow, making the Plan the

biggest development project ever carried out in Bangladesh.

Confirmation that the overriding objective of the Plan is the construction of high embankments comes from the World Bank's own assertion that "controlling the major rivers is the [Plan's] underlying assumption";[6] the "guiding principles" for the Plan drawn up by the Ershad government which include "safe conveyance of the large cross border flows to the Bay of Bengal" by construction of "embankments on both sides" of the major rivers, and the insistence in 1991 of the Dutch representative on the Plan, Wybrand van Ellen, that "the belief that effective protection against flooding in Bangladesh is possible only by constructing a system of embankments along all the major rivers is the very basis of the Flood Action Plan".[7]

Controversial from the start, the Flood Action Plan has been opposed by a broad spectrum of Bangladeshi and Western economists and environmental experts, and even those within the international aid establishment.

Ferocious Rivers

Bangladesh's main rivers are among the largest, most powerful and "most violent" in the world.[8] The Ganges is five kilometres wide at some points, the Brahmaputra 10 to 15 kilometres. The rivers all converge in a relatively small area, given their volume, to form an "integrated circuit" which cannot be compared to rivers which have been "tamed" elsewhere. "It is an act of grave error to either underestimate or overlook the absolute difference between the processes of training a single river and the problems of subduing a system of rivers" such as Bangladesh's.[9]

The rivers are constantly refashioning the 60,000 square kilometre delta. Their paths are highly mobile with river channels shifting hundreds of metres overnight. In the late 18th century, the Brahmaputra followed a course towards the sea which was well to the east of its present course. In 1787, however, a smaller river to the north, the Teesta, suddenly changed its course after an earthquake and joined the Brahmaputra which in turn was forced to seek a new channel. The Jamuna river became its main course towards the Bay of Bengal, a shift which brought the Brahmaputra up against the Ganges which flows into Bangladesh from the west in India and "threatened to shut up the Ganges." Even today, "the battle between the Brahmaputra and the Ganges could not reasonably be supposed to have yet been fought to a decisive finish."[10]

As Bangladesh's river and delta systems are extremely complex, knowledge about them is very limited. A Task Force on the Action Plan for Flood Control, set up under the interim government of President Shahabuddin Ahmed between the overthrow of Ershad in late 1990 and the election in February 1991 of Begum Khaleda Zia, judged that "it is painful to note that the research work in the relevant fields has altogether been neglected."[11]

Creating Floods

Flood control and flood prevention are not new to Bangladesh. When the British colonists came to Bengal in 1757, they reported seeing thousands of kilometres of embankments, most of which had been built two centuries before. These were modest affairs, designed to prevent major damage rather than routine flooding.[12] Following discussions on flood control in the then East Pakistan, the 1957 Krug Mission Report noted that "opinions are divided on the merits of flood embankments." But in line with proposals contained in a 1964 Master Plan, prepared by the US International Engineering Company which modelled control of Bangladesh's rivers on that of the Mississippi, a governmental body was formed, the East Pakistan Water and Power Development Authority (WAPDA), and assigned the task of constructing dykes.[13]

Organizations of the Bangladeshi peasant movement and economists point out that, far from containing the floodwaters, these dykes actually cause flooding. Each year an estimated 2.4 billion tons of silt, moving in beds of up to a kilometre long at rates of 600 metres a day, are carried downstream by the rivers. Because embankments prevent this silt from being deposited in the floodplains, it accumulates on the riverbeds. Unless large-scale, costly dredging operations are carried out, the river levels gradually rise and water pours over the embankments, leading to potentially more severe effects than before the canalization. To prevent these overspills, embankments have to be built higher and higher until the river bed is well above the surrounding land, still creating potential disaster if the river overflows. In the long run, therefore, embankment construction is self-defeating. Moreover, the floodwater and intense monsoon rain cannot drain off from the fields into the rivers but stays where it is, causing waterlogging and crop failures.

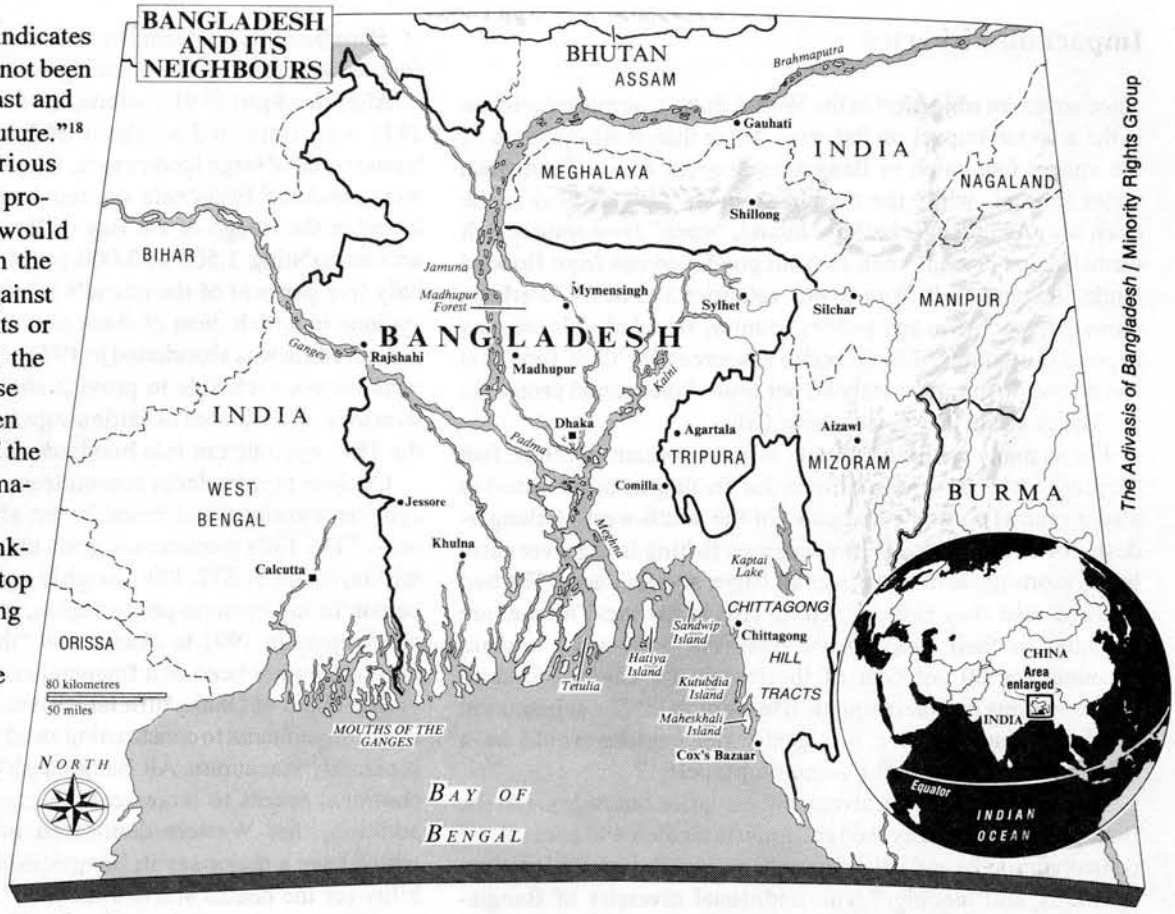
The Eastern Waters Study of the Flood Action Plan, sponsored by the US Agency for International Development (USAID), points out another cause of more severe floods due to embankments: "Embankments do not reduce [the volume of] floodwater . . . Excess water that is confined [within embankments] in the stream bed higher in the river will increase the volume and velocity, and perhaps the depth, of the flow".[14] In addition, the speed at which the river flows is increased dramatically by the tendency when constructing embankments to eliminate bends in the river which would otherwise slow the water down.

The embankments initiated by the Flood Action Plan would have a "replacement effect" as well; the floodwaters would not be reduced, but merely moved at high speed downstream to the Bay of Bengal. This would clearly add to the dangers faced by people living on river islands and in the coastal regions who are already vulnerable to cyclonic flooding. "Rather than providing the protection from catastrophic flooding that the project is [supposedly] designed for, construction of high embankments would actually increase the risk of devastating flooding", commented the International Rivers Network.[15] The Eastern Waters Study castigates plans to channel the rivers between high embankments as "engineering hubris likely to lead to a massive waste of scarce resources".[16]

Bangladesh's experiences with flood control river embankments are a strong argument against building more of them, especially in one of the world's most earthquake-prone areas.[17] The Flood Action Plan, however, appears to have completely glossed over these experiences. Even the internal audit of a World Bank-financed flood control project, the main component of which was the rehabilitation of a 225-kilometre embankment along the right bank of the Brahmaputra, built under yet another earlier Bank scheme, points to the "extraordinary absence of formal evaluations of flood control investments in Bangladesh after twenty-six years of experience." The audit recognized as well the "continuing pressure for large-scale capital-intensive 'solutions' to the flood control problem when

all available evidence indicates that such schemes have not been cost effective in the past and are unlikely to be in the future."[18]

There are also serious doubts as to whether the proposed embankments would even be able to contain the massive forces pitted against them. "No embankments or river training works in the world can control these forces if they are taken head on."[19] Stretches of the right bank of the Brahmaputra which were "protected" with an embankment in the 1960s to stop floodwaters from spilling across northwestern Bangladesh are just one example where the river "took little notice of this impediment" as it continued its centuries-long westward shift in course.[20] During the river floods of 1990, significantly less than those of 1987 and 1988, "reports came in virtually every day about the breaching and collapse of embankments" under erosion from the rivers.[21] Sudden river channel shifts could make the Flood Action Plan obsolete overnight.[22] Bangladeshi economist Shapan Adnan believes that "the historical track record of existing flood control and drainage projects displays recurrent and systematic failure of such physical constructions."[23]



The Adivasis of Bangladesh / Minority Rights Group

The funnel-shaped topography near the mouths of the main rivers, the Padma, Jamuna and Meghna, accentuates the sweeping devastation of cyclonic tidal surges.

Careful, regular maintenance would, therefore, be essential if the embankments were to survive. But given the record of neglect of existing flood control embankments, the lack of stone and building materials within the country for construction and maintenance, and the high maintenance costs of the new embankments to be borne by the Bangladeshi national budget, estimated at some US$ 0.9 billion, this cannot be assured.

Compartmentalization

As if acknowledging the risk of devastation downstream, the Plan proposes building "compartments" behind the main river banks of the Brahmaputra river. These would be self-contained, low-lying areas of land surrounded by dykes, rather like giant polders in The Netherlands, one of the countries supporting this section of the plan. When the volume of water is just too great even for the embanked river, it can be let into a particular "compartment", even though people may be living and farming there, and released back into the main channel later.

Various Bangladeshi organizations have raised major objections to the compartmentalization sections of the Flood Action Plan, drawing on their experiences of earlier controlled flooding schemes. The "inherent weaknesses" of such schemes have led to "human-made ecological disasters", such as inlets and outlets silting up and fields becoming waterlogged.[24]

A prime example is at the Dakatia *beel* (shallow wet depression), a polder scheme in the west of Bangladesh in Khulna and Jessore districts which was designed by foreign "experts" as part of the 1964 Master Plan. For the last eight years, the *beel* has been badly waterlogged; polders intended to keep fields flood-free have resulted in a year-round coverage with water because the sluice-gates and discharge canal no longer function. Vegetation has decayed and the number of fish declined.[25] The situation became so bad that the local peasants formed a *Beel* Dakatia Action Committee and in September 1990, thousands of women and men breached the polder's embankments to let out the water, despite official orders for a security clampdown.

The Bhuapur Development Project, a non-governmental organization active in *char* villages along the Brahmaputra where the Flood Action Plan's "pilot" compartmentalization is to be carried out, claims that it duplicates a failed 1968 irrigation project. "The results of [the Dhaka-Narayanganj Demra] project are clear cut and the examples seem more than adequate for the concepts of compartmentalization . . . Why is it important to spend another 20 million dollars on the project that can promise little more than the exact same results? Not only that, but why do the same experiment on each bank of the Jamuna?"[26]

With no recognition in the World Bank's plans of the substantial settlement on *char* areas, the Bhuapur Development Project points out that inhabitants, who have not been informed about the compartmentalization scheme, let alone consulted, are in danger of being washed away. If the embankments go ahead, as many as six million people will be more at risk from flooding.[27]

Impact on Fisheries

Another major objection to the World Bank's proposed scheme is the adverse impact on fisheries. More than three-quarters of the annual fish catch in Bangladesh comes from inland fresh water sources, while the remaining quarter is gathered in the open sea. As much as half the inland, "open" freshwater catch (rather than "closed" such as from ponds) comes from flooded lands, the other half from rivers, estuaries and *beels*. "Perhaps more than people in any [other] country, Bangladesh's citizens depend on natural wild fisheries resources for their food and livelihood." Approximately 80 per cent of the animal protein in the Bangladeshi diet comes from fish.

For as many as three-quarters of poor peasant families, fish "capture" (the Bangladeshi term for fishing in open water) is also a crucial source of income. In the south-west of Bangladesh, for example, landless women go fishing in the river early in the morning, armed with small cages and fish nets. The two or three *taka* they earn by selling fish in the local market are essential to their family's survival. As open-water capture accounts for 80 per cent of the freshwater catch, access to surface waters and their aquatic life is crucial.[28] The substitution of closed-water culture for open-water capture would be a substitution of private for common property.[29]

As most fish hatch in rivers and estuaries but migrate to the floodplains, where they feed and grow in rivulets and *beels*, flood control, drainage and irrigation schemes inhibit their migration, spawning and feeding.[30] The traditional diversity of Bangladesh's aquatic life has already been drastically reduced by existing embankments which have "left scores of fishing villages in decay".[31] Construction of more embankments would be a direct assault on the livelihoods of millions of landless families who depend on fish; even without such deprivation, they are often threatened with starvation and death.

Questioning the scientific validity of the World Bank approach, Shapan Adnan points out that the focus of the environmental study, a "supporting" section in the Flood Action Plan, is to investigate the implications of new embankments and compartments, and how to limit environmental damage, not to assess whether such schemes should be constructed in the first place. "The essential strategy of constructing compartments based on polders and embankments is *not made contingent* on the findings and outcomes of vital investigative studies."[32] These criticisms, made soon after the Plan's adoption, seem to be validated as construction work has already started, without studies of the impact on the environment, fisheries and agriculture and local inhabitants attempted.[33]

Cyclone protection

Although cyclonic floods cause many more deaths and much more devastation than river floods, coastal protection is quite simply neglected in the Flood Action Plan; a minor section only is included on rehabilitation of coastal embankments and afforestation.[34] This omission should in itself lead to a complete overhaul of the Flood Action Plan, if the intention is to limit disasters in Bangladesh.

Bangladeshi and foreign experts both agree that it is technically feasible to construct multi-storey shelters near people's dwelling places and earthen *killas* (raised mounds) for cattle which would provide protection from the cyclonic floods. None of Bangladesh's governments, however, have allocated resources as a priority to cyclone protection.

After the April 1991 cyclone, the total of shelters built since 1971 was estimated at about 300, most of them near the homesteads of large landowners, whereas at least five thousand were needed.[35] Eight safe shelters had been built on Swandip island in the trough of the Bay of Bengal by April 1991, each accommodating 1,500 to 2,000 people at most — enough for only five per cent of the island's inhabitants before that year's cyclone in which most of them died.[36] The raising of *killas* to protect cattle was abandoned in 1974 after 157 of them had been constructed, each able to provide shelter for 300-400 head of livestock. The number of cattle swept away by tidal bores during the 1991 cyclone ran into hundreds of thousands.

Cyclone preparedness committees, which are meant to issue cyclone warnings and assist in the aftermath, exist on paper only.[37] The 1988 government grant to these committees was 2.4 million *taka* (US$72,000), roughly equivalent to 0.24 *taka* per person in the cyclone-prone region, reason enough for Dhaka newspapers in 1991 to charge that "the cyclone preparedness programme has been in a financial crisis for a long time."[38]

The claim of Dhaka officials that scarcity of resources is the major impediment to constructing an adequate number of shelters is patently inaccurate. All Bangladesh's governments have had continual access to large-scale foreign aid, which implies, in addition, that Western-dominated international institutions, which have a major say in Bangladeshi affairs, share responsibility for the deaths and destruction.[39] Dutch hydrologist Fred Koch has questioned the narrow cost-benefit analyses of Western institutions which have hampered allocation of resources for construction of shelters and *killas*, stating that "donors are only willing to invest large amounts when the economic feasibility is made clear."[40] Successive governments since 1975 have instead spent aid on show projects and strengthening the military — between 1980 and 1988, defence expenditure rose 73 per cent[41] — or else they have simply pocketed it.

Land and social issues

Besides the lack of shelters and *killas*, another main and related cause of the high death toll after cyclones is the failure of successive governments to implement social reform, particularly land reform. Those who were killed or made homeless by the 1991 cyclone were overwhelmingly landless peasants who did not have a secure plot of land elsewhere in Bangladesh. "Land constitutes the most significant basis of socio-political power and the common factor of production for the overwhelming majority of the people. The land problem remains the main social problem in Bangladesh today . . . affecting the greatest number of people."[42]

Unequal land distribution, fragmentation of land holdings and land erosion all contribute to widespread landlessness in Bangladesh (*see* Box p.245). Combined with the increasing lack of waged work in rural areas, many landless and land-poor families settle on newly-emerged land in the large rivers and along the Bay of Bengal beyond the coastal embankments, even though they know full well that by settling on such shifting land, their lives are constantly at risk from the cyclones.

Their vulnerability to the vagaries of nature is accentuated still further, especially in the coastal areas, by the power of the *jotedars*, the ruthless local landlords, and their armed strongmen.

Landlessness and Land Distribution

Well over 60 per cent of Bangladeshis are involved in agriculture, and over 80 per cent of the people live in rural areas. At least 65 per cent of the land surface (which fluctuates each year because of river erosion and silt deposits) is cultivated. Rice is by far the main crop, much of it grown for immediate consumption; jute is still important, although the market for the country's one-time major export has collapsed.

Most agricultural workers belong to the ranks of the landless and the small peasantry who make up 78 per cent of all rural households. Figures vary as to the exact amount of landlessness, but all reports agree that it affects the majority of the people and is increasing.

Land ownership is inequitably distributed. A 1983-84 nationwide survey indicated that small farms averaging 0.93 acres make up more than 70 per cent of farms, but take up only 29 per cent of farmland. Medium-sized farms, on average just over four acres, account for almost a quarter of farmholdings and nearly 46 per cent of farm area, while large farms, on average almost 12 acres in size, are barely five per cent of farmholdings but account for a quarter of the farmland.

After independence from Pakistan, various laws provided for a land ceiling of 199 *bighas* (66 acres) and redistribution to the landless of *khas* — government-owned fallow land along the rivers and coasts. Included in this category was *shikisti*, or newly-deposited land, such as the *char* sandbars and islands. The adoption of the Land Manual in 1987 gave additional legal backing to the redistribution of *khas*. But by and large these have remained paper laws: the government has remained unwilling to intervene in the landownership pattern.

By 1976, only 25 per cent of *khas* land which was available for settlement had been distributed. Although official figures for the southern Noakhali district show that 67 per cent of available *khas* land has been distributed, the real figure is closer to 17 per cent. Much of the land has been misappropriated by local powerful people and corrupt officials. In the southern regions of Bangladesh, where the largest tracts of available *khas* land are found, much of the land is monopolized by *jotedars*, petty landlords who rent it out on a share-cropping basis in return for 50 per cent or more of the harvest. Contravening laws on land ceilings and *khas* distribution, *jotedars* own up to 2,000 acres of land each. In the *char* areas along the coast, landless families are at the mercy of the armed strongmen paid by the *jotedars*. After much pressure, the *shikisti* legislation was repealed during Shahabuddin's interim government, removing the last legal deterrent to landgrabbing by *jotedars* and exposing the landless and rural poor to yet more rural violence.

Since the legislation on *khas* land was passed, however, organizations of landless peasants and agricultural-labourers have been pressurizing *jotedars* and the authorities for its implementation. Blockades (*gherao*) of the local administration offices are a common tactic to persuade the authorities to act. In March 1990, for example, some five thousand women and men encircled the government office in the coastal island district of Bhola demanding action on widespread corruption and implementation of *khas* land distribution. In one *char* area of Bhola, landless people are charged two to three hundred *taka*, instead of the official one *taka*, for the government application form for *khas* land.

In August 1991, after a week-long sit-in by some five thousand peasants, mainly women, around the government building at Doshmina in Patuakhali district in the south-west, the senior governor of Khulna area visited several recipients of *khas* land titles and found that hardly any of them had been landless. In January 1992, eight thousand landless families marched to four large *char* areas along the coasts, encompassing 22,000 acres of land which had been illegally held by *jotedars,* and put up thatched huts on them. Organizations such as the Bangladesh Agricultural Labour Union have been demanding that *khas* land be distributed as a priority to women heads of households, excluded under current legislation because they are not usually cultivators.

The Flood Action Plan promises only to exacerbate these inequities of land tenure. Land will be taken to construct embankments and many char areas up -river are likely to be submerged. According to some NGOs, between six and eight million people may have to be displaced. The World Bank in neglecting land tenure issues is not only ignoring the root of the problem; it is planning to make it worse.

Tineke Jansen/Bangladesh People's Solidarity Centre

Members of the Kisani Sabha (Bangladesh Peasant Women's Association) march through the streets of Dhaka in April 1991 with placards demanding that the landless be provided with khas *land".*

Jotedars force newly-settled, officially landless, families to submit to a regime of sharecropping in which half of the crop goes to the landowner, despite this being illegal. As poor peasant women and men live in constant fear of losing their land and belongings to the *jotedars*, they hesitate to respond to any warning signals on the eve of cyclones to evacuate, fearing that they will be deprived of the land they have probably struggled to gain ownership and use of. Yet "due to their class character the various strata of the ruling bourgeoisie of Bangladesh are not willing to implement a genuine land reform. At the same time they are incapable of a meaningful land reform [as] . . . the government machinery is totally corrupt and inefficient."[43]

Bangladesh's élite draws enormous advantages from Bangladesh's aid dependency; it is not surprising that they want to perpetuate the country's disasters so as to syphon off the vast sums which flow in. For them, the mass deaths and destruction accompanying cyclones are unavoidable; their prevention would not serve the élite's interest.

Such interests stand to gain from the Flood Action Plan and its subsequent programmes as well. Bangladeshi construction firms expect lucrative contracts, while those living in Dhaka and those seeking to transform Bangladesh into a modern Western-style economy hope for permanent protection from floods.[44] In rural areas, richer landowners, who want to invest further in new, high-yielding varieties of rice which cannot tolerate sudden inundations, hope for protection from all floodwater. Their hopes concur with the World Bank's stated aim of the Plan: "higher economic returns from land, property and infrastructure" and its declaration that "economic justification of flood control rests more on the enhancement of land use than on the reduction of flood damage."[45] Expected increases in food production from high-yielding rice varieties justify the costs of the Flood Action Plan, according to the World Bank, even though such a food action plan would be better served by irrigation in the drought season.[46]

A peasant weeds rice fields with her feet. Agriculture is the mainstay of Bangladesh's economy, but those who work the land do not reap the profits.

Sarah C White/*Arguing with the Crocodile: Gender and Class in Bangladesh* Zed Books

The benefits to Bangladesh's élite are in marked contrast with those of the people who would be adversely affected by the Plan which "will become a massive nationwide device for depriving the country's poorest people of the free natural resources of the rivers — its silt and fish and floodwaters — and for channelling the dangerous face of the rivers in their direction."[47]

"While the 'aid and consultancy' game [with its own sets of local and expatriate beneficiaries] is nominally undertaken in the 'name of the people', the people themselves appear to have remained helpless spectators, watching from the sidelines, if at all."[48] The Flood Action Plan was designed autocratically by the World Bank in collusion with Ershad's military dictatorship, without consulting the people of Bangladesh. Information about the Plan has become available and comment published in the print media only since the downfall of Ershad's regime, even though Prime Minister Khaleda Zia's government has endorsed the Plan. The February 1991 report of the Task Force set up under the interim government, criticizing the fact that the Plan had not been publicly debated, recommended a moratorium on all construction activities until the results of the studies on the Plan's socio-economic and environmental impact were available and Bangladeshi public opinion had been properly consulted.

Adapting to the Floods

Besides land reform and social restructuring, sound management of water resources is key to the welfare of most Bangladeshis. Flood management, however, does not necessarily mean flood prevention. "Between the extreme of zero control and zero floods lies a wide range of alternatives, which seek to maximize the beneficial effects of floods while minimizing their damages."[49] These alternatives would adapt to rather than try to defy the natural forces unleashed on the country. "People in this region have adopted many ingenious ways of living through the floods," points out the Eastern Waters Study.[50]

A process of flood mitigation involving non-structural measures should be considered, such as flood forecasting and warning systems. As Bangladesh may have as many as 10,000 different varieties of wild rice which are pest and flood and/or drought resistant, flood-resistant rice could be grown at different levels in the floodplains. These varieties grow as the water level rises, some of them more than 15 centimetres in 24 hours, while others grow in water so deep that the grain is harvested by boat. Bamboo stakes and fences can support and protect the rice crops as can the planting of natural grasses, canes and trees. Submersible embankments which would check flooding only during the crucial early weeks of the rice crop, becoming submerged under the floodwaters later, should perhaps be considered as well.

In terms of not only social justice but even sheer effectiveness, it makes more sense to spend a fraction of the resources required to carry out the Flood Action Plan on support to grassroots' organizations of peasant women and men which have already made the implementation of agrarian reforms their political priority. If organizations sympathizing with landless peasants were to make a realistic assessment of flooding in Bangladesh, the people would not remain prey forever to "natural" disasters.

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13. The now defunct WAPDA was the predecessor of the Bangladesh Water Development Board.
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32. Shapan Adnan, op. cit. 5., original emphasis.
33. Amid much confusion, it seems component 3.1 Jamalpur Pilot, funded by the EEC and France, and component 20, the Compartmentalization Pilot Project, funded by The Netherlands and Germany, are already underway. Two projects, which were initiated before 1988 but have been brought under the umbrella of the Flood Action Plan, have also begun: component 1 Brahmaputra Right Embankment Strengthening, funded by the World Bank, and component 21/22 Bank Protection and Pilot Project, funded by France and Germany,
34. Resolution of the working group on coastal protection, adopted at the seminar "Bangladesh Disaster: Issues and Perspectives", Delft, The Netherlands, 3 September, 1991. Coastal embankments, some two to three metres high, combined with planting trees on the seaward side of the embankments can mitigate the effects of massive tidal surges, but the main function of these embankments along an 800 kilometre coastline is to protect agricultural land from normal high tides and tidal salinization.
35. See, for example, Clause 1 of the Resolution on the Catastrophe in Bangladesh, adopted by the European Parliament on 16 May, 1991.
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37. Koch, F., op. cit 36.
38. "Unpardonable Unpreparedness", *Holiday*, 10 May, 1991.
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Books

The Third World Credit Crisis

LENT AND LOST: Foreign Credit and Third World Development, by Cheryl Payer, Zed Books, London and New York, 1991, £8.95 (pb), 154pp. ISBN 0-86232-953-1.

Cheryl Payer's *Lent and Lost* is superb. In only 126 pages of lucid, tightly-argued prose, Payer demolishes some of the most firmly-held assumptions of development analysts and activists from left, right and green perspectives. In Payer's own words, *Lent and Lost*, "strikes at the jugular of conventional development theory: the belief that a constant flow of large amounts of foreign capital is a necessary condition for the success of the ill-defined process called 'economic development'."

The key to Payer's argument is beautifully simple: loans must, by definition, be repaid; and the repayments will usually be much more than the original sum borrowed. Shout it from the rooftops of a hundred aid agencies: loans must be repaid. "There is nothing surprising about this, indeed, it is so banal it is hardly worth mentioning. That is the way loans are supposed to operate." It is significant that the word "debt" does not appear in the title of Payer's book: the Debt Crisis would be more accurately described as the Credit Crisis.

According to conventional macro-economic development theory, aid loans to the Third World should be used for productive investment. When money is wisely invested it makes more money, and this extra money can be used to repay the original loan. The theory diverges from the real world on two main counts. First, for a variety of reasons connected with donor and creditor government self-interest, greed and corruption, most loans to the Third World are not invested in productive enterprises. Furthermore, to be able to service, and eventually repay, loans, a project must not only be productive but competitive on the international market. And "the productive, profitable, hard-currency-earning plants must earn enough not only to service their own borrowing, but to pay as well for all the borrowing for all the non-exporting, non-profitable, non-productive, and downright wasteful projects that went on that country's bill during its borrowing binge."

Second, "if [development] theory had worked as predicted the consequences for the creditor countries, in terms of loss of markets and competition at home, would have been catastrophic for their own economies." The creditor countries, not wanting to suffer catastrophe, have therefore prevented the theory from working.

To repay loans, countries must generate a trade surplus. If the developing world is to export more than it imports the developed world must necessarily do the opposite. But the industrialized countries are not prepared to run the long-term trade deficits with developing countries necessary for the Third World to generate the hard currency to pay off its debts. The First World has to choose between having bad debts or having its industries destroyed by Third World imports. It chooses the former.

The Roots of the Crisis

Payer shows how, during the 1940s, US economists were well aware of the problems that the repayment of post-war foreign loans would cause the US economy. Capital was given to Europe under the Marshall Plan in grant rather than loan form, "precisely because it was recognized that the United States did not want to receive the massive flow of goods from European factories which they would have been required to accept in repayment for loans." In the immediate post-War period, it was not US policy to make official loans for economic development. Private investment, it was assumed, would move the necessary capital, while grants would be given only as military aid to staunchly anti-Communist governments.

The intellectual and political case for a long-term programme of economic aid was put forward in the second half of the 1950s by a group of ex-CIA academics, most notably W.W. Rostow (author of *The Stages of Economic Growth*, one of the most influential post-war economic treatises) and Max Millikan. These authors argued that funds should be moved from military to "development" assistance if aid was to accomplish what they called "its basically political and psychological purpose."

Congress, however, was unwilling to grant money to the developing world for the indefinite future. It believed that loans would force developing countries to take more responsibility for how funds were spent. In the words of one Congressman quoted by Payer, "a person who asks for a loan knows that he might have to repay it, and therefore asks for as little as possible, whereas someone asking for a grant asks for as much as possible". The cold warriors concluded that if grants were politically impossible, loans were far better than nothing. "And on the repayment problem they sounded like Scarlett O'Hara: We'll think about that tomorrow, or maybe in twenty or thirty years."

It did not take long for the inevitable to happen. By 1957, many countries were having serious problems repaying their loans. The "solutions" adopted then were basically the same as those advocated now. First, the payment of interest was "rescheduled" to a later date: between 1956 and 1969, 11 debtor countries carried out a total of 21 debt rescheduling exercises. Second, fresh, "rollover" loans were provided to ensure that debtors had enough funds to pay interest on earlier loans. Both measures served only to postpone the approach of the "break-even point" when the countries' repayments would exceed incoming flows of capital. The lenders were dampening the flames of debt by throwing more wood on the fire.

More importantly, the reschedulings and new credit were provided as incentives for the adoption of import and exchange liberalization measures, formulated by the International Monetary Fund, in its position as the collective voice of the creditor nations. The key demand of the IMF was, and still is, the abolition of import and exchange controls, which were

designed to conserve scarce foreign exchange. While the devaluation which the IMF insisted upon theoretically discouraged imports, new credit encouraged them, by financing the inflow of goods and services the creditors wished to sell, no longer hindered by import controls. Likewise, "capital flight", much criticized by creditors after the debt crisis broke, was made perfectly legal under these liberalized exchange regimes.

> "The net effect of the IMF-designed stabilization programs was to 'bail out' the debtors from their immediate crisis . . . while piling up obligations for the future . . . It was . . . a very effective means to allow creditors to continue to sell goods to the debtor while exerting foreign control over the debtor's economy; and thus a telling indicator of the real agenda of the creditor governments. Good performance in meeting rescheduled debts was not valued as highly as faithful submission to IMF demands which actually worsened future debt service capabilities."

The Petrodollar Myth

By 1970, the international credit system was in crisis, a condition documented in a flurry of reports commissioned by among others the World Bank and the US government. Of $727 million in foreign loans to Mexico in 1971, a mere $31 million was left over after the servicing of old debts. Yet it was at precisely this moment that commercial bankers began to throw hundreds of billions of dollars at Third World countries already deeply in debt.

Payer advances a number of "partial answers" for the seemingly totally irrational behaviour of the banks in the 1970s. Her explanations include the invention of banking techniques which seemed to minimize risks and maximize profits, and the instalment of pro-Western, IMF-supervised governments in countries such as Chile, Indonesia and the Philippines. IMF involvement in a country's economy was perversely taken as a sign that loans were secure, while in fact it usually meant that the country was experiencing acute economic difficulties.

The most important factors in the banks' behaviour, however, Payer believes, were the dramatic rise in commodity prices, and hence Third World export earnings, in the early 1970s (like most booms, this one was thought to be a permanent trend), and the fact that banks assumed that bad debts would always be made good by reschedulings and infusions of new money from creditor governments.

> "One of the most tragic ironies of the decades-long debt drama was that the rise of raw materials' prices did indeed hold the promise of allowing at least some countries to surmount their debt burden . . . But the countries which had such excellent export prospects became the most alluring clients for the banks, who pressed too many large loans upon them . . . Creditworthiness, by attracting too much new lending that was not really needed, contained the seeds of its own destruction."

The conventional explanation for the Third World debt crisis — that it was a direct result of the four-fold increase in the price of petroleum in 1973/4 — is dismissed by Payer as a myth. She demolishes both versions of this theory: that developing countries had to borrow to pay for essential imports of fossil fuels (it was the oil exporting countries such as Indonesia, Venezuela, Algeria, Nigeria and Mexico that received most of the new commercial credit); and that banks saw the Third World as the only possible outlet for a huge glut of petrodollars invested by oil-rich countries (dollars deposited by OPEC countries accounted for only a small fraction of total loans). Bank lending to the Third World in fact began and experienced its greatest relative expansion well before the oil price rise.

However, Payer argues that the oil shock was a "significant watershed" for another reason. In 1975, the IMF and the World Bank issued reports urging banks to lend and developing countries to borrow, and leading politicians and international financiers gave speeches with the same message. The reason for this enthusiasm for debt build-up, Payer surmises, was that industrial nations needed to offset oil price rises by increased exports to the Third World, exports which could only be paid for on credit. This policy was followed with such ardour that the IMF "devoted a lot of energy to persuading countries which had low debt burdens and were not in any type of imminent default or crisis to liberalize controls and to begin massive borrowing." Payer illustrates her point with case studies from Tanzania, Jamaica and India, where "IMF and World Bank loans and advice to borrow commercially preceded and . . . caused or contributed heavily to the subsequent debt crisis or problems." In this respect, "the Fund and Bank must be considered among the major perpetrators of the debt crisis."

In late 1981, gross new lending by banks to Latin America began to decline. Payer contends that most of the banks were aware of impending disaster, but could not admit it publicly as such a blow to international financial confidence would be a self-fulfilling prophecy. "The cheerleading continued right up to the brink of the crisis." Just weeks before Mexico announced it could not service its debts, the IMF and the World Bank published a report which concluded that there was "considerable scope for sustained additional borrowing" from private sources.

In 1982, the bubble finally burst and the long-inevitable debt crisis "officially arrived". The defaults by Argentina, followed by Mexico and Brazil, happened at the same time as Latin America reached its "break-even point" and began to pay out more money in debt service than it received in new lending.

Cleaning up the Mess

The final section of *Lent and Lost* is entitled "Solutions", although Payer admits that the title must be taken as ironic. The best that can be done, she concludes, is to try and clean up the worst of the mess left by the debt crisis, and take measures to prevent it from happening again.

The first part of Payer's "solution" is for the debtors to repudiate their debt. She concedes that creditor-led reduction strategies may eventually bring repayments down to levels which would permit the resumption of commercial lending and increased trade." But she warns: "Debt forgiveness . . . will be selectively distributed as a reward to governments which accept the type of structural adjustment 'reforms' now being pushed by the World Bank and the Brady Plan . . . It will prove no panacea either for the dependence of Third World governments or for the poverty of their people, but exactly the contrary."

Payer also argues that unless forgiveness of debts is done by all major creditor governments more or less simultaneously, it will accomplish nothing for the debtors. Forgiveness by some major creditors will simply shift funds to the creditors who do not forgive. Repudiation by the debtor is superior to forgiveness by the creditor as "only the debtor is in a posi-

tion to reduce debt service across the board to all its creditors, thus affording them equal treatment and retaining cash to spend for its own needs."

The chief argument against repudiation is that defaulting countries will never receive another penny of credit, yet the truth is that they are not getting any net credit at present. Furthermore, the credit they do get is from international institutions which force them to implement plans which only make their debt worse. In Payer's words, "the economic advantage of repudiation to the debtor countries is so obvious that knowledgeable observers are at a loss to explain why it has not happened long ago."

While Payer admits that it is difficult to predict the extent of retaliation and harassment from creditor nations, she believes that such costs have been exaggerated. Although the experience of Brazil and Peru in limiting and halting debt repayments respectively was disastrous, Payer argues that this was due to domestic policies rather than any retaliation from creditors. In 1980-81, the Sandinista government in Nicaragua won the most lenient debt settlement in recent years because their creditors knew that the alternative was the repudiation of the debts incurred under Somoza's dictatorship. Yet even though the Nicaraguans came to an agreement with the banks, credit was not restored and the country was subjected to a decade of US-sponsored military retaliation. Honouring the debt did little good for Nicaragua.

But the most convincing reason why debts have not been repudiated is that:

> "The individuals and classes which are in control of the governments of most of the debtor countries still see their own interest as lying in obedience to the interests of creditor countries. The minister of finance who crosses the will of creditors, for example, cannot expect to get a cushy job at the IMF or World Bank when he or she leaves office, as more obedient colleagues can. Similarly, these narrowly based groups stand to benefit more from the small trickles of aid and forced lending that pass through their fingers as they come in, than they pay as their share of the larger sums that go out."

Payer's analysis of the debt crisis casts doubt not only on official "solutions" but also on those proposed by development and environment groups, which usually depend on debt cancellation by donors and on vague proposals to raise commodity prices as a means of guaranteeing "fair trade" for developing countries. Unless strict limits are put on new flows of credit, however, debt cancellation and another commodity price boom will merely spark off another credit boom and sow the seeds for another debt crisis.

The second part of Payer's solution to the debt crisis is thus to restrict future credit severely — something which is anathema to most development economists and analysts. Payer, in fact, is critical, not only of loan capital, but of all kinds of foreign investment and grant aid:

> "Direct investment shares with foreign loans the candid objective of taking out of a country more than is brought in; while grants share with loans the detrimental effects of harmful conditionality, competition with local producers, and the encouragement of waste and corruption. In addition, grant aid is usually designed to induce long-term dependence on costly imports of specialized inputs or spare parts obtainable only from the donor."

Perhaps the only substantive criticism that can be levelled at *Lent and Lost*, a book which should become a classic, is that it should have discussed non-aid loan capital flows at greater length. The advocates of aid, whether for "environment" or "development", are so strongly convinced of what Payer terms "the myth of development through capital imports" that they will surely miss the point that Payer's

arguments do not apply only to loans.

While Payer admits that, "it is probably as useless to try to ban credit as it is to ban alcohol or other drugs which give humans a temporary high", she does suggest guidelines to restrict foreign borrowing in the future. First, the idea that poor countries are "natural" importers of capital must be discarded. "The ideal should not be long-term lopsided borrowing, with countries divided into semi-permanent creditors and semi-permanent debtors, but should aim at balance . . . over the short term." Second, foreign borrowing for consumption should only take place in an emergency such as a widespread harvest failure. Third, foreign creditors should not impose conditions on their loans or hide behind IMF or World Bank conditionality: "creditors only fool themselves if they believe they can control [the uses to which their loans are put]. And conditions imposed by outsiders far from the site of the investment usually do more harm than good." Fourth, citizens in the borrowing country should be enabled to debate the social utility of loans before they are entered into. Fifth, "when loans go sour, creditors must swallow their losses. This is axiomatic within the US domestic context: bankruptcy law recognises the desirability, from the point of view of the economy as a whole, of wiping bad debts off the books."

Finally, international claims should be registered on an official and public list. Payer argues that the role of clerk of this registry may at last provide a useful function for the World Bank. Creditors whose loans were not publicly registered would have no legal claim on a country's foreign exchange reserves. If a country set a legal limit on the amount of debt service payable in any given period, the registry would show new creditors other claims on a country's future earnings. If the amount of debt service exceeded this legal limit, the registry would establish automatic priorities for debt service.

Payer concludes *Lent and Lost* with a quotation from Shakespeare: "For loan oft loses both itself and friend, and borrowing dulls the edge of husbandry." Maybe one useful function for aid agencies would be to frame this quotation and send it to all of the international bankers and financiers of the world — along with a copy of Payer's superlative book.

Patrick McCully

Dust to Dust

OUT OF THE EARTH: Civilization and the Life of the Soil, by Daniel Hillel, Aurum Press Ltd, London, 1991, £19.95 (hb), 322 pp. ISBN 1-85410-203-6.

Hillel is a traveller from an antique land. His story is of shattered civilizations that came to grief because they failed to nurture the soils and the lands that sustained them. His book warns us that we have failed to learn the lessons of history. Not only are we repeating the mistakes of the past, but doing so on a vastly greater scale, scouring the planet for more lands to exploit and in so doing ruining them. Hills shorn of trees, soils exposed to driving rains or clogged with salts, and rivers so silted that they burst their banks are just some of the litany of examples that Hillel provides.

Like Walter Lowdermilk, Vernon Carter and Tom Hale before him, Hillel finds the evidence wholly compelling that the history of civilization and conquest is implacably connected to how the land has been used and the state of the soil. If the Phoenicians sailed from Lebanon to conquer and settle other regions in the Mediterranean, they did so once they had milked their land of its natural resources of forests and a healthy soil. If the Greeks embarked on conquest, it was because the land was failing them. The Romans and a host of other groups of people found themselves in need of *lebensraum* because they had exhausted their homelands.

Hillel is an orthodox soil scientist with an interest in hydrology, who has worked in countries over five continents. Having spent part of his childhood in Israel, where land reclamation was pursued with passionate zeal, he saw for himself the lengths to which the ancient Israelites had gone to conserve soil and water. The careful terracing of slopes, the ingenious way in which water aquifers deep in the mountains were tapped, and the constructing of cisterns in bedrock were just some of the techniques developed in pre-Christian times.

Wise management and understanding of land-use has therefore always been possible; degradation of natural resources need not have been an inevitable consequence of agriculture. But with the final

conquest of Israel by the Romans some 2000 years ago, the land with its carefully constructed terraces was left to fall apart. As Hillel points out, terraces are only effective as anti-erosion devices when they are well-maintained. A terrace that is breached may become worse than useless, allowing the once-retained soil to wash away in torrents with the first rains.

The problems today are many times more acute. In Egypt, for instance, there are more than 55 million people whereas their number was stable for millennia at two million. Industrialization and intensive agriculture have taken their toll. The damming of the Nile to provide hydro-electricity and irrigation is unleashing a chain of problems, including salinization, waterlogging and dwindling fertility, which had always been kept at bay before.

Moreover, we are only just beginning to understand the subtle relationship that evolved between natural vegetation, evapo-transpiration and the water table. Upset that balance by removing the natural tree cover and replacing it with crops and, without our being aware of it, the water table rises, bringing up salts. Or extract too much water for irrigation and salty water moves in, destroying a sweet water source. Erosion, salinization and waterlogging are now destroying as much, if not more, land than that being brought under cultivation. Such degradation of our land resources is by no means limited to Third World countries. Some of the most disturbing salinization problems are in the United States and Australia.

Is our current predicament one to cause despair? Hillel calls himself a "conditional optimist" inasmuch as he believes we have the choice to avoid our current path of destroying and degrading our remaining natural resources. We are now far more aware of the mechanisms that operate when we exploit land for agriculture and given such initiatives as the Brundtland Commission, we should, so he says, be able to use our resources far more equitably and wisely than in the past. Despite the evidence of history, Hillel believes in progress. I detect some illogicality in that. How is it, that with all our knowledge and technologies, the situation we now face is orders-of-magnitude worse than in ancient times when, Shelley tells us, Ozymandias, King of Kings, asked us to look on his works . . . and despair?

Peter Bunyard

Trading in Futures

GENERATION GAMES: ***Genetic Engineering and the Future for Our Lives***, by Pat Spallone, The Women's Press, London,1992, £7.95 (pb), 343 pp. ISBN 0-7043-42707.

In January 1992, the British government's *Report of the Committee on the Ethics of Gene Therapy* concluded that there were "no new ethical issues" at stake in the burgeoning field of human genetic manipulation. In a leader article shortly afterwards, *The Economist* claimed, with similar confidence, that: "The birth of genetic therapy marks the beginning of an age in which man has the power to take control of his genes and make of them what he will". "The proper goal", it concluded, "is to allow people as much choice as possible about what they do".

Such bold claims have become increasingly frequent as more and more new technologies of genetic manipulation and control become available, enabling an ever greater range of possible bio-management strategies. These are inevitably technologies for the future: their main goal is control of the regenerative process. The widespread equation of these new technologies with progress, hope and benefit is worrying, both in its shortsightedness and in its powerful appeal.

Pat Spallone's book presents an articulate and convincing challenge to this technological and biological determinism. Spallone is a scientist by training, and this is the most clearly written account I have read of many of the pioneering commercial products, such as human insulin, bovine somatotrophin, and genetically engineered seeds and vaccines. As a short history of genetic research and development, it is both fascinating and terrifying. Spallone's material often speaks for itself, though she is not afraid to reveal her own personal position, experience and feelings.

She locates the source of the problem not only in the new technologies themselves, but in what she calls "gene-think" — the conceptual systems and habits of thinking which make such "answers" appear feasible, desirable and legitimate — indeed, that make them appear to be "answers" in any sense whatsoever. Spallone does not restrict herself to cautionary tales of unsuccessful product development in the burgeoning bio-industries: where products meant to increase production diminish it, "healthy" products turn out to be pathogens, or "more choices" turn out to be fewer real options. She is also concerned with the consistent denial of these failures in fraudulent and irresponsible accounts of the safety, efficiency, reliability and other putative benefits of the new genetic technologies; and with what gene-think obscures through its reductionist, mono-causal determinism.

The central section of *Generation Games* examines how this way of thinking is becoming more and more well-established in the context of global scientific projects such as the Human Genome Initiative — the effort to "map" all 46 human chromosomes. In the chapter entitled "Genes-the-Cause", Spallone investigates a number of recent cases involving the search to find "the gene for" various conditions, such as cystic fibrosis or Huntington's Chorea. These cases clearly demonstrate the difficulty of subscribing to a genetically-based epidemiology: there are simply too many other factors at stake, and even for the few "single gene disorders" where a correlation is strongest, there remain too many questions about genetic expression and function to know what this correlation actually means. Furthermore, these cases illustrate *the desire to believe* in a form of genetic determinism, which would appear to be increasingly influential, and worryingly so.

"Genes-the-Cause" describes the desire to control human traits by controlling their source. But this in turn rests on the assumption that it is possible to discriminate between desirable and undesirable traits, and, correspondingly, "good" and "bad" genes. In extreme cases, such discriminations may appear straightforward. But most cases are not extreme: most "genetic defects" do not correlate to a single gene, and most human physical impairment and disease has less to do with genes than with environmental factors. Yet gene-think leads to the assumption that many human afflictions are the result of what Spallone calls "genetic burden", which, through technological assistance, can (now, thanks to modern science) be alleviated. In Spallone's view, however, "we are not laden with a 'genetic burden' or 'morbid genes'. We are weighed down by the concept of 'genetic burden'".

BOOKS DIGEST

- THE GULLIVER FILE: *Mines, People and Land: a Global Battleground*, by Roger Moody, Minewatch, London 1992, £150 (hb), £25 to NGOs and *bona fide* researchers from Minewatch only, 894pp. Distributed by Pluto , London, ISBN 0-7453-0607-1 (bookshops) and Uitgeverij Jan van Arkel, A. Numankade 17, 3572 KP Utrecht, The Netherlands, ISBN 90-622499-X (libraries).

An exhaustive file of information on nearly 4,000 mining companies and subsidiaries operating in over 120 countries. The subject matter ranges from Rossing Uranium, which merits 30 pages, to the putative assassination of Karen Silkwood by her employers, Kerr-McGee. An invaluable reference work; organizations campaigning in other fields would do well to emulate it.

- FIXING THE RULES: *North-South Issues in International Trade and the GATT Uruguay Round*, by Kevin Watkins, Catholic Institute for International Relations, London, 1992, £6.99 (pb), 144pp. ISBN1-85287-104-0.

Watkins ably delineates the double-bind that GATT imposes on the South. The Uruguay Round proposes to restructure the rules of trade around the interests of powerful transnational corporations. But its rejection would bring about a descent into economic Darwinism, arbitrary protectionism and US gunboat diplomacy. As the Jamaican delegate to GATT remarked, "The draft package is reflective of the distribution of negotiating power, and whether or not we are prepared to accept it . . . is academic."

- THE GROWTH ILLUSION, by Richard Douthwaite, Green Books, Ford House, Hartland, Bideford, Devon, 1992, £27.95 (hb), 367pp. ISBN 1-870098-41-2.

A wide-ranging, thoroughly researched examination of how "economic growth has enriched the few, impoverished the many and endangered the planet". Douthwaite, a former economist, enriches his statistical evidence with the long-range vision of the historian and a good measure of common sense.

- SIMIANS, CYBORGS, AND WOMEN: *The Reinvention of Nature*, by Donna J. Haraway, Free Association Books, London, 1991, £12.95 (pb), £29.50 (hb), 287pp. ISBN 1-85343-139-7.

"This book treats constructions of nature as a crucial cultural process for people who need and hope to live in a world less riddled by the dominations of race, colonialism, class, gender, and sexuality." Covering themes explored in more depth in the author's outstanding and original volume *Primate Visions*, this book includes the influential "cyborg manifesto" essay which signals the current breakdown in boundaries between science fiction and social reality, humans and animals, animal-human and machine, and physical and non-physical. Written by one of the most challenging thinkers of today.

- GENDER AND TRIBE: *Women, Land and Forests*, by Govind Kelkar and Dev Nathan, Zed Books, London and New Jersey, and Kali for Women, New Delhi, 1992, £11.95/$19.95 (pb) 187pp. ISBN 1-85649-036-X.

That deforestation and displacement for development affect the livelihoods of local people, indigenous peoples perhaps disproportionately so, is recognized at certain levels. This book points in addition to how such pressures give rise to patriarchal tendencies and changed gender roles among the people affected, leading in turn, to witch-hunts and new taboos against women.

- INDIGENOUS VISION: *Peoples of India Attitudes to the Environment*, India International Centre Quarterly, Spring/Summer 1992, 40, Max Mueller Marg, New Delhi, 304pp. (pb), ISSN 0376-9771.

A fascinating collection of articles by Vandana Shiva, Anil Agarwal, Winin Pereira and other distinguished anthropologists and environmentalists, which pays tribute to the ecological wisdom and cultural diversity of India's indigenous peoples — now threatened by development. "Everything is being reduced to a kind of uniform mayonnaise or kedgeree," laments R. K. Biswas. The book concludes with a long interview with Medha Patkar, the inspirational activist from the Narmada non-violent resistance movement.

Also of concern to Spallone is the capacity for new genetic technologies, and the mentality that goes with them, to exacerbate existing forms of inequality. Most obvious is the potential for the new genetic determinism to encourage the classification of persons according to their genotype, whereby characteristics such as intelligence levels, criminality, deviance, sexuality and, more recently, even attributes such as shyness are seen as quantifiable and predetermined by an individual's genes. People will be affected by genetic engineering according to their social position. Just as in the United States it has recently become publicly recognized that it is black Americans who bear in great disproportion the burden of living near hazardous waste materials, so too is it likely that the burden of biohazards will, like the profits and benefits, be unevenly distributed.

Spallone pays attention to the patriarchal dimensions of a genetic technology which is the product of a male- and masculine-orientated scientific tradition. The claim by *The Economist* that "man has the power to take control of his genes" is justly worded, for these technologies belong to a long history of reproductive management and control which continues to exploit women physically, emotionally and psychologically. Yet what makes genetic engineering a gender issue is also what makes it a general concern.

Nonetheless, neither the interest nor the investment in new genetic technologies and their corresponding horizon markets are going to disappear: this technology is here to stay, and will undoubtedly be a major force in shaping the rest of this century and the next. The struggle to democratize the process of technological innovation by working in and through existing institutional structures presents in many ways a harder challenge than simply determining what is wrong with genetic technology. This book is a valuable contribution to the effort to resist what Pat Spallone rightly describes as the "relentless" pace of current innovation in the field of genetic science; it will make accessible to a wider readership the unprecedented ethical, social and political dilemmas to which this field gives rise.

Sarah Franklin

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Letters

Gendered Rationality

In her review of my book *Rethinking Ecofeminist Politics* (*The Ecologist,* Vol. 22, No. 1, Jan/Feb 1992), ecofeminist Val Plumwood asserts that my portrayal of ecofeminism as "apolitical, anti-rational . . and involving a total repudiation of the intellectual and political traditions of the West" is a "stereotype". But Plumwood's own article, 'Feminism and Ecofeminism', in the same issue of *The Ecologist,* provides little reason to doubt the accuracy of my description.

How is it possible to avoid concluding that ecofeminism is anti-rational when Plumwood argues that "the Western concept of reason", which is "masculine," "has provided one of the main intellectual bases for the domination of women in Western culture"? Plumwood objects to a strategy in which women are to "join men in participation in . . . rationality". She routinely denounces Western philosophy for its "exclusive focus on the universal and the abstract", which she sees as not only "masculine" but part and parcel of that culture's "oppression" of women and nature. Despite the danger of perpetuating patriarchal stereotypes of women, Plumwood thinks feminists need the "woman-nature connection" as preserved by ecofeminism in order to understand this "masculinity of culture".

If feminists do follow her in believing that Western philosophy has been "exclusively" abstract and universal, they will simply be ill-informed. Plato was painfully aware of the difficulties in the universals he proposed, while medieval Christian theology revered "the Book of Nature" as second only to scripture as a source of knowledge of "God". Empiricists like Locke, sceptics like Hume, and pragmatists like Dewey — all were critics of universalistic abstraction. Still, it remains unclear whether coherent human experience is even conceivable without generalizations of some kind — such as the ones with which Plumwood so extravagantly denounces Western rationality. Nor does she seem to have noticed my discussion of social ecology's dialectical reason, a form of rationality that constitutes an organic alternative to instrumental reason.

Plumwood's ignorance does not prevent her from trying to correct me: "Plato did not take the soul of the world to be female", she intones against me. Actually, Plato *did* regard the "world-soul" as female, in *Timaeus* (37a), as ecofeminist Carolyn Merchant noted rather prominently in *The Death of Nature.* Plumwood would do well to familiarize herself with the basic literature in her field before she accuses others of being "poorly informed"!

And is it really stereotyping, as Plumwood alleges, to regard ecofeminism as depoliticizing, even apolitical? She herself, in her *Ecologist* article, advances a series of psychologistic platitudes about reconstructing masculinity and femininity with which few thinking people today, despite their handicap of not being ecofeminists, would disagree. But separated from a public political context (which she denounces as "masculine"), such privatistic formulations allow the political and social to be reduced to the psychological and personal, as exemplified by feminist-turned-New Ager Gloria Steinem's recent assertion: "it's time to turn the feminist adage around . . . *the political is the personal.*"

I argue for social ecology's *concrete* political approach — libertarian municipalism, a form of confederated direct democracy to countervail statism. (Plumwood, missing the confederalism, dismisses this as "local control.") A decentralized public sphere would make possible a direct democracy that is much more accessible to those involved in domestic concerns. Plumwood's own political approach, whatever it may be, apparently does not involve democracy, direct or otherwise. For her, the historical sins of the democratic tradition — especially the Athenian *polis*'s exclusion of women, slaves, and resident aliens from citizenship — are apparently irremediable. Outrageously and manipulatively, she insists that I "refuse to acknowledge" these exclusions. Not only do I so, I leave no doubt that they can and must be remedied — a necessity that Plumwood trivializes. I regard these very real exclusions as historical, not "central" to the democratic tradition as such — unlike Plumwood. The potentiality of the democratic tradition that the Greeks initiated is much in need of fulfilment — not rejection.

The need to "reconceptualize masculine and feminine" is surely compelling as well, but doing so in the name of feminism creates another problem of exclusion: men. Plumwood rejects "humanism" as excluding women, but humanism as a concept is hardly exhausted by the rigid masculine or anti-ecological constructs by which she defines it. Eternalizing an opposition between feminism and humanism viciously locates women outside humanism altogether. In all its history, human-ism has been in the process of transformation. An ecological humanism that encompassed gender "reconceptualizations" and women's liberation would be consistent with the development of that tradition, and immensely desirable.

Plumwood's primary contribution to ecofeminism, however elegantly couched in the fashionable jargon of academia, is to exaggerate an already simplistic critique of Western dualism into terms more rigid and nightmarish than even the historical record warrants. Such caricatures do considerable harm to feminist and ecological thought and politics in the real world.

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Val Plumwood replies . . .

Janet Biehl's response to my review repeats and even intensifies many of the approaches I found most problematic in her book, especially stereotyping and misrepresentation, failure to take account of important theoretical developments especially in feminism, and political conservatism.

Ecofeminists whose views don't match Biehl's anti-rational stereotype (and there are few who do) find them cut and trimmed to fit. Biehl demonstrates for all to see her well-practised techniques of misrepresentation by omitting crucial qualifications in presenting and quoting from my work. I (and the many other feminists who make similar kinds of criticisms) have never rejected rationality outright or in all forms. The oppositional and dualistic conception

of reason which underlies the rationalist conception of human identity as outside a lower and alien sphere of nature leaves a disastrous legacy of ecological problems. This is one conception of reason, one which in the west has its roots in the master identity of the Greek polis formed in class/race, gender and species supremacy. But it is not the only possible construction of reason and its contrasts, and its feminist and postmodernist critics (myself included) have in most cases stressed the need to rework the concept, and the inadequacy of a reversal approach which simply embraces its exclusions.

The claim that I object to women's participation in (any form of) rationality, which I claim is "masculine", is gross distortion. I point to the lack of gender neutrality in these dominant ideals of reason, and their exclusion not only of women, but of what has been counted as the sphere of nature. Reason as so construed is "masculine" in the sense that it has defined itself in opposition to what has been counted as the feminine and the natural, and both women and men should challenge and change such a concept. I am certainly not saying that women should make a virtue of irrationality, that they are excluded by their nature from neutral and unproblematic practices of reason, or that they should leave reason to men and stick to knitting, as Biehl's presentation suggests.

The main conclusion of my paper (somewhat abbreviated perhaps in the edited version The Ecologist printed) is that the woman nature connection should not and does not need to be accepted in its traditional form, and that women have options for escaping it in ways which do not perpetuate human/nature dualism and the inferiorization of the sphere of the feminine and of nature. Why would anyone aiming at fairness try to present this as "perpetuating patriarchal stereotypes of women"? Biehl (despite her claim that my analysis of gender dualism is platitudinous) continues to misread the rejection of dualism in terms of crude reversal, which is precisely what my analysis shows is damaging and unnecessary. Similarly, I do not think that the social can be reduced to the personal or individual-psychological, and my work gives no licence at all for this claim. What is particularly useful about feminism's attention to the politics of the personal though, as Black feminist bell hooks points out, is the challenge to our personal participation in systems of domination.

A reassessment of the rationalist emphasis on the abstract and universal and inferiorization of particularity is now underway not only in feminist but in more conventional philosophy (for example the partiality debates in ethics). It does not indicate ecofeminist atavism, as Biehl suggests, nor does it imply the belief that generalisation can be dispensed with. I did not suggest that the rationalist tradition is the only tradition in western philosophy, but that it is the dominant tradition, both in the sense that it has framed the dominant conceptions (for example of reason, of the human and of nature) in terms of which western culture has encountered the world, and in the sense that other traditions or schools have positioned and defined themselves in relation to it. It is the one we most need to understand in order to change our culture and challenge its still vigorous reason/nature dualism.

It is a good indication of the way Biehl has painted herself into a corner in her sweeping condemnation of ecofeminism that she needs to appeal in her reply to the ecofeminist scholarship she condemns in her book to justify her claim that Plato saw the world soul as female. But the primary source (Timaeus 37A) Biehl cites lends no more support to her claim than this: the older translators of Plato who translate the Greek word for soul (psyche) as female throughout Plato's work also, not surprisingly, translate it as female in this passage of the Timaeus on the world soul. But such a translation is misleading for several reasons, and as Elizabeth Spelman has noted, is in serious conflict with Plato's implicit treatment of souls (for example in the Republic) as gendered variously male and female. It is in conflict too with Plato's leading metaphor in the Timaeus, in which matter (chaos) plays the inferiorised female role ("nurse" or "receptacle") to the maleness of cosmos, representing rational order. Platonic philosophy kick-starts the rationalist tradition of reason/nature dualism.

I too believe that more democracy and participation, not less, is needed to right social and ecological wrongs. The exclusions built into the humanistic ideals of reason, democracy and public life Biehl defends may not be irremediable, but they are not incidental or minor either as Biehl insists, and to make them truly democratic these ideals are in need of the same kinds of thoroughgoing revision as those of reason. Biehl's conservative analysis resists this revision in the case of women by insisting on the gender-neutrality of these ideals, and her call for women's participation in them is empty in the light of this insistence. Biehl's condemnation of the critique of these ideals remains rooted in the liberal concept of the individual and the human and resists revision of its anti-women and anti-nature biases. Debate is to be welcomed, and there is no single voice here which can claim to speak for all women. But Biehl's conservative coverage of ecofeminism distorts and dismisses virtually the entire contribution feminist thought has made to ecological-cultural critique, defending, drawing on and promoting prefeminist male theory, especially that of Bookchin. The book's influence in radical green circles will therefore be a gauge of their continued sexism and failure to study, acknowledge and respect women's contributions.

Corrections

The photograph of a British street scene on page 125 of *The Ecologist*, Vol. 22, No. 4, should have been accredited to Roger Mayne/Mary Evans Picture Library. All photographs by Mark Edwards in the same issue are from Still Pictures. *The Ecologist* apologizes for these errors.

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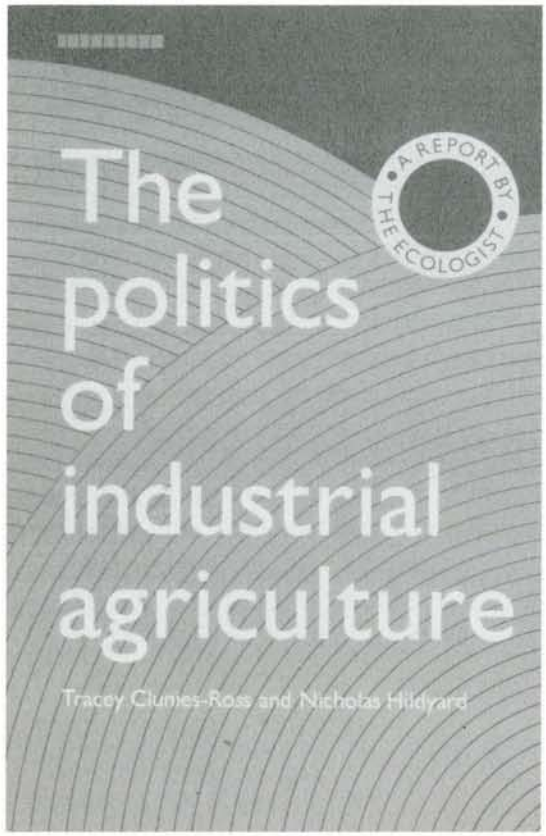

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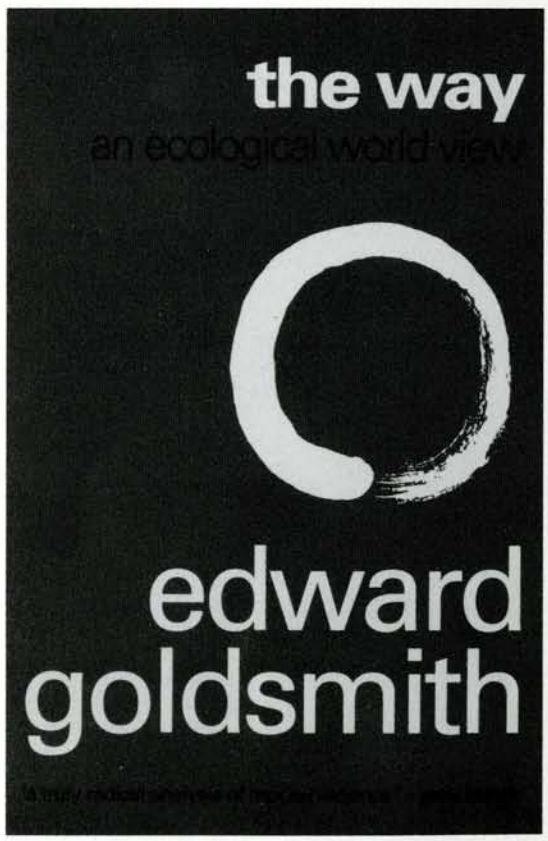

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