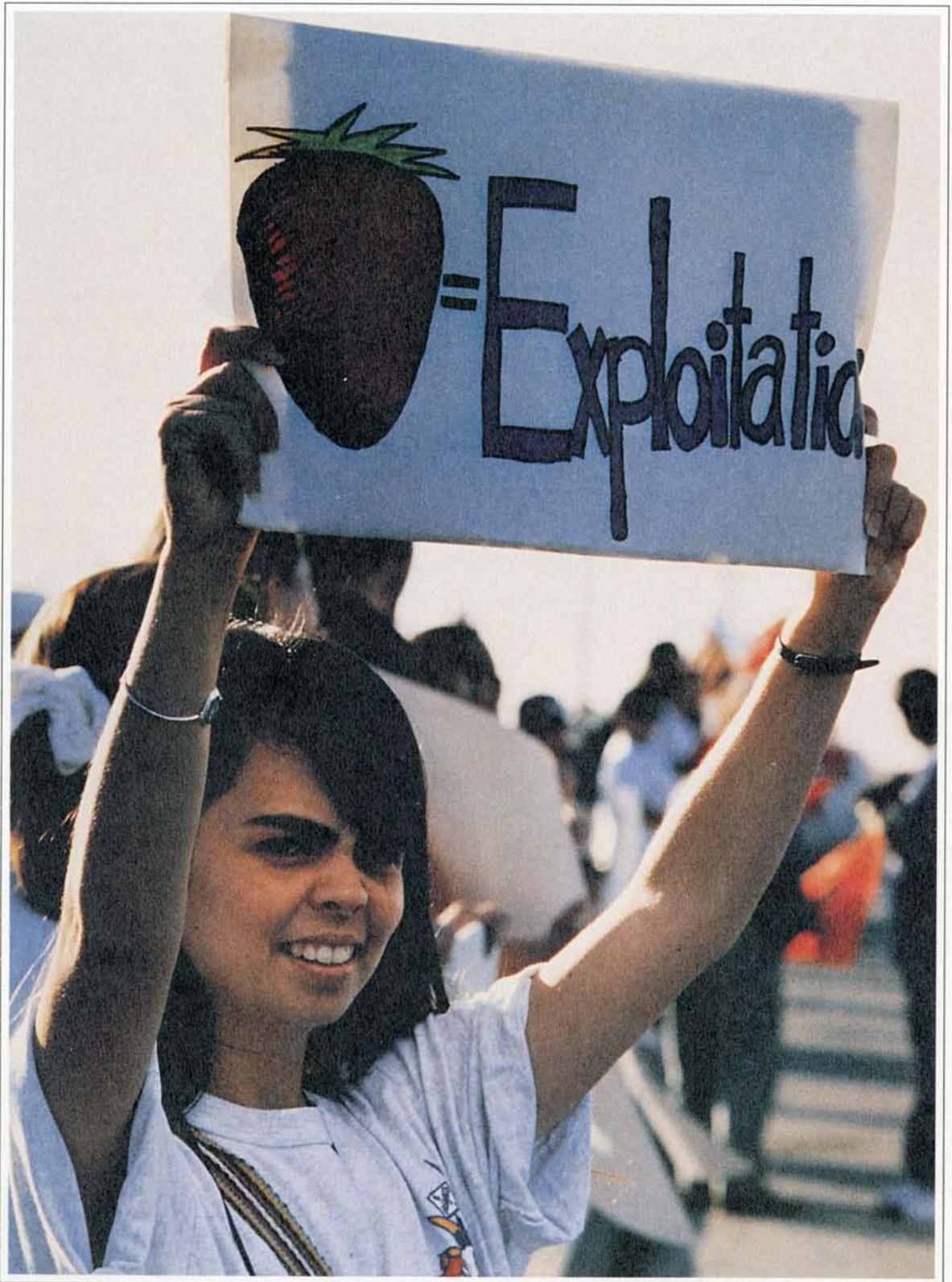


# The Ecologist

Vol 27 No 3 May/June 1997

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**Cover:** Strawberry workers in California demonstrating against working conditions (David Bacon, California). *The Ecologist* is printed on recycled paper, whitened with hydrogen peroxide.

# Beating the Green Backlash

The British press have recently been suffering from a dose of "Swampy fever": Britain's best-loved anti-roads protester has become a reluctant media star. Indeed, what with Swampy becoming a celebrity, direct action successes against planned road construction at Fairmile in Devon and a proposed second airport for Manchester, the old British government's decision to dump Nirex's proposed nuclear waste dump, and the new government's commitment to tackle head-on issues raised by the motor car, it might seem that environmentalists have never had it so good.

But there is a price for green success. All over the globe, environmental activists are facing a backlash designed to intimidate them into inactivity and silence. With the collapse of communism, environmentalists are increasingly being identified as scapegoats for threatening the triple engines of unrestricted corporate capitalism, right-wing political ideology and the nation state's protection of the status quo. Backlashes against movements for social change take many forms, but they always include violence, which often goes unreported or under-reported.

## Going Global

The green backlash is most advanced in the United States where anti-environmentalism has spawned the "Wise Use" movement. Wise Use activists and politicians are polarizing the environment debate away from solutions into direct confrontation. Corporations are funding groups attempting to gut environmental legislation and spending vast amounts of money on public relations in an attempt, on the one hand, to demonize the environmental movement so that it loses popular support and, on the other, to coopt environmental debate. The logical extension of such vitriolic rhetoric, scapegoating and scaremongering is harassment and violence.

Just as the Wise Use movement is going international under the banner of "sustainable use", so too the backlash has gone global. It has mostly occurred around resource issues such as forestry in Canada and Australia as well as the US. In India, environmentalists have been beaten up, vilified and shot for objecting to the building of dams and the relocation of multinational corporations to their country. A brutal reminder of the price of activism was the murder of Ken Saro-Wiwa and other Ogoni in November 1995 in Nigeria. Over 2,000 Ogoni have died since they started their campaign for social and ecological justice. People in the Philippines, Malaysia, Indonesia and Bougainville have also suffered violence and repression.

In Latin America, those opposing oil companies exploiting the Amazon in Ecuador have been threatened. The violence against people trying to stop the forests in Brazil from being cleared has been brutally bloody. In Britain, one of the fastest growing grassroots movements, the anti-roads movement, has had its own backlash in which women have been especially targeted.

## Beating the Backlash

"If you are being effective," says Vandana Shiva, "there will be a backlash. In fact, that the backlash is occurring is a tribute

to the environmental movement because it shows that the environmental movement is making a difference. If someone does not make a difference, there is no backlash."

The green backlash, born out of both the success of the environmental movement and its failure, is still to run its course, particularly as global conflicts over water, wood, whales, metals, minerals, energy, cars and even consumerism continue. Many more activists will be intimidated, beaten up, vilified and killed for working on ecological issues. The backlash is now an integral part of working on, writing on, speaking on, campaigning on or even teaching ecological issues.

The backlash must compel environmentalism to reevaluate itself and realise that while it has not run out of ideas nor run its course, it is in danger of running out of time. It must face up to some painful realities: many people were corrupted by the very system that they set out to change. Others with legitimate concerns feel that the mainstream environmental movement has failed them.

To beat the backlash, the environmental movement has to return to the grassroots. Environmentalism grew out of local action. In the US today, however, it is now seen as an elitist, city-based movement that has no presence in rural areas at the grassroots. Indeed, the anti-environmental movement has beaten environmentalists at their own game over the last few years and thus been able to exploit the weaknesses of mainstream environmental groups, particularly their apparent neglect of people and social concerns.

Environmentalism has to be about empowering people to change society. The only way to start rebuilding this definite agenda and positive message is to campaign and talk face to face, door to door, street to street and community to community. Environmentalists also have to demonstrate that the anti-green policies of polarization put forward by the Wise Use movement and certain sections of industry do not serve the workers or communities in which they live. The only beneficiaries of such actions are the corporations whose primary interest is profit maximization. It also has to highlight that many of the corporations backing anti-environmentalism have a history of working against, not for, the public interest.

In addition, the environmental movement has to broaden out to work closely with other groups. Environmentalists have to start working with other campaign groups, with workers, with women, with unions and other progressive organizations to address social, cultural and development issues as well as ones of ecological equity. "The environmental movement that does not link up to social justice and equity issues", says Vandana Shiva, "won't even need a backlash to become irrelevant."

The environmental justice movement in the United States and the disparate groups of people — squatters and anti-road activists, travellers and hunt saboteurs — who came together to fight the Criminal Justice Act in Britain are examples of grassroots community-based action that have influenced the political process, where the empowerment of activism overcame political disillusionment.

But groups need to broaden out still further, building coalitions across continents. The environmental movement needs to respond to the challenges posed by the globalization of the marketplace, the internationalization of industry and trade and the threat of global pollution together with other

groups who share common interests. The various groups who have come together to campaign against Shell's operations in Nigeria, Europe, Peru and the US have certainly made the company realise that it cannot carry on drilling for oil, whatever the ecological or human costs.

Working with other groups, environmentalists have to undertake what is possibly the hardest challenge in beating the backlash: to come up with positive solutions to the problems of the inequality of world trade, to the global environmental, social and health problems associated with the current economic system. For instance, the environmental movement needs to ask some difficult questions to make corporations face up to some awkward realities, in particular that their activities may never be sustainable, and somehow to make

multinationals accountable for their ecological, social and cultural impact.

The ultimate challenge is to find an economic system that does not destroy the world. Local empowerment rather than global repression has to be the way forward, if we do not want an unregulated anarchic global sweatshop, run by all-powerful companies in cohorts with corrupt politicians who do not care, and have no need to care, about worker and environmental protection, financed by speculators addicted to the global gamble. The backlash has given the environmental movement the opportunity to change for the better. It should not blow that chance.

Andrew Rowell

Andrew Rowell is author of *Green Backlash: Global Subversion of the Environment Movement*, Routledge, September 1996.

## Trade Liberalization and Women Workers

Through the World Trade Organization, the "liberalization" of trade — the removal of any nationally-imposed barriers or restrictions to trade between countries, such as tariffs or quotas or local regulations on investment — is underway throughout the world. Such liberalization is producing widespread changes in patterns of production which are threatening the rights of workers everywhere.

The opening up of markets around the globe means that it is easier than ever before for multinationals to relocate their operations to areas of lower wages or higher tax breaks in search of the highest profit margins. The resulting competition among countries and workers has led companies to be on the constant look-out to reduce their costs by increasing the flexibility and intensity of work. For workers, this means casualization and constant insecurity, increased work loads and longer hours. The deregulation of labour markets, part of the free trade agenda, is facilitating this process by removing protective legislation and minimum wage agreements.

Many national governments now claim that it is impossible, and even undesirable, to protect labour standards if a country is to participate successfully in the world market. Labour organizations and trade unions, meanwhile, are finding it more and more difficult to bargain effectively at the local and national level.

One of the main strategies advocated by the international trade union movement, notably the International Confederation of Free Trade Unions (ICFTU), to confront these changes at a global level is the inclusion of a social clause in World Trade Organization rules which would mandate certain defined labour standards. Infraction of a social clause, according to current proposals, by a country would lead to trade sanctions against that country, authorized by a joint advisory body of the WTO and International Labour Organization (ILO).

The United States, most EU countries and the ICFTU support the introduction of trade-related labour standards into the WTO. Many developing countries and NGOs oppose the move. Martin Khor of the Third World Network claims that social clause proposals are "prompted not by concern for the well-being of labour, but by protectionist moves aimed at competitive imports from the South".

### Key Issues for Women Workers

All these developments have particular implications for women, both as paid and unpaid workers. The increased demand for a low cost, flexible and ultimately dispensable workforce in the new global economy has translated into a

preference for women's labour. Many women in countries North and South are being forced to accept appalling working conditions in order to sustain their families in the face of deteriorating living standards. Meanwhile, market forces take no account of the responsibilities of workers for the care of families and communities.

Although women workers are among those most adversely affected by trade liberalization, most of them are unaware of the current debates and deliberations surrounding social clauses and labour standards. The issue is raised in high-level international forums, both intergovernmental and non-governmental, in which few women are present or participate, and in which workers tend to be referred to without reference to their gender.

Much of women's work is already beyond the reach of existing national and international legislation and regulation. Much of it is unrecognized and unremunerated domestic, agricultural and industrial labour. Even paid employment in export industries, such as garments, toys and electronics, is often hidden away in homes or small workshops at the end of a company's sub-contracting chain. Women workers are more likely to be employed on a part-time, casual or temporary basis.

Social clauses, however, would relate only to paid work. If introduced, it would be highly unlikely that international labour standards would be enforced beyond the formal sector; to do so would require massive monitoring resources at a local level. Pressure to enforce labour standards could lead to an even greater difference in pay and working conditions between the formal sector and the informal sector and unpaid work, which would tend to widen the gap still further between men and women workers.

### Rights of Women

Social clause proposals define labour standards with reference to conventions of the International Labour Organization (ILO). All of these include freedom of association, the right to collective bargaining and the abolition of forced labour. Many include the prevention of discrimination in employment, equal pay and minimum age of employment. Although these ILO conventions have been widely ratified as representing the fundamental rights of all workers, only a few countries effectively put them into practice; the number which do so is decreasing with the expansion of the free trade agenda.

Many women regard freedom from discrimination and

the right to equal pay as basic rights. But in practice, in the few countries where attempts to implement these rights have been made, progress has been achieved only as a result of strong lobbying and the deployment of considerable resources. The proposals for social clauses do not include provision for such resources at an international level, nor resources clearly allocated for women's organizing both within and outside trade union structures.

Would trade sanctions as a result of a social clause being contravened be imposed objectively — or would they actually be applied selectively by the most powerful nations? Although all countries would, in theory, have equal access to the procedures, there is a risk that sanctions would in fact be applied to weaker countries or would be linked to other political agendas, whilst politically powerful violators, such as the United States (which has not ratified the ILO convention on the right of workers to organize themselves) go unchecked.

Under current social clause proposals, any move to impose sanctions would be decided in high-level negotiations, no doubt involving protracted and legalistic procedures. The demands and interests of workers, particularly women workers, would barely be represented in such negotiations.

As far as women workers are concerned, other demands — particularly reproductive rights and the right to bodily integrity — invariably top the list of their concerns, yet are rarely mentioned in mainstream debates on workers rights and social clauses. The failure to recognize workers' rights to produce and care for children has prompted strong campaigns over the years by women workers for maternity leave, childcare facilities and the right to refuse to work overtime, among other issues. Increasingly, these are seen as rights for men as well as women. Freedom from physical and sexual abuse — not only sexual harassment but also enforced pregnancy testing or providing evidence that a woman is not pregnant — is frequently identified by women as one of their most urgent rights as workers. The shame attached to these issues, however, means that it is rarely raised in formal discussions on workers' rights.

## The Context of Social Clauses

Proposals for social clauses tend to be considered separately from the free market agenda and structural adjustment programmes. IMF and World Bank policies in particular have been widely criticized for driving down pay and working conditions for the poorest workers and for women in particular. Cut backs in public expenditure, deregulation and privatization are all causing a widespread deterioration in working conditions. Social clauses would put many governments of developing countries in a double bind: on the one hand, they have to introduce programmes which operate against any improvement in labour standards; on the other, they would be threatened with trade sanctions if such standards were not improved.

Economic changes associated with trade liberalization have reduced women's chances of achieving greater equality in many countries. Opportunities for education and training have been reduced and the burden of domestic labour increased. What could be achieved by ending discrimination at work through a social clause if women are at the same time denied the right to education? Or by bringing about equal pay if women do not have the right to control their earnings?

Likewise, many activists point to difficulties stemming from the ILO convention on the minimum age of employment. All are against the exploitation of children, but many feel that without a genuine commitment to financing

children's education or to the employment of adult family members, the value of externally-imposed sanctions is highly questionable.

Social clauses can have value only if they are set within the framework of an overall campaign to reverse the negative impacts of current economic policies. This involves specific measures to achieve greater economic justice for women.

## Company Responsibility

Social clauses are targeted at governments. Their goal is to impose trade sanctions against countries which fail to ensure adequate labour standards. It is companies rather than governments, however, that are immediately responsible for these standards. It is companies which systematically exploit women as a cheap labour force and fail to acknowledge basic worker rights. As long as trade sanctions are imposed on a country-by-country basis, companies can avoid improving standards by moving their production sites.

To be fully effective in improving labour standards, social clauses would need to be accompanied by the enforcement of independently-monitored company codes of conduct which, to reach the majority of women workers, would need to operate throughout sub-contracting chains as well as parent companies.

## Local Action

The priorities for most workers are firmly rooted in everyday working life. Social clauses are high level bureaucratic instruments which would have an effect only in the context of local struggles. No internationally imposed regulations can work unless they are backed up by action at the local and national level. This means that the demands made in such regulations need to be consistent with the demands made by the workers they are intended to protect. It also means that workers need to be involved in the processes of implementing and monitoring new regulations such as social clauses.

International support is needed to ensure that workers have the ability and resources to organize around their demands. Particular support is needed for women workers, most of whom are poorly represented in trade union structures. Unions have not tended to organize in the informal sector where most women are based; even in sectors where women union membership is high, the leaders tend to be men.

Without such support, the gap will widen still further between the high level legalistic bureaucracy of social clause implementation and women's everyday struggles to gain more control over their working lives. As long as this gap remains, so will the threat to labour standards.

It is far from clear whether introducing a social clause into WTO rules would be in the interests of the majority of women workers. It is clear, however, that social clauses in themselves cannot tackle the problems. They need to be set in the context of support for workers' rights and women's rights. They need to consider the differential gender impacts of free trade and to challenge the fundamental causes of gender inequality beyond the workplace.

*Angela Hale*

**Angela Hale** is a research fellow at Manchester Metropolitan University and Coordinator of Women Working Worldwide, a UK-based NGO working with a global network of women worker organizations. Women organizing within and outside the trade union movement in First and Third World countries were consulted in the process of writing this editorial, including international and national networks, regional alliances, and local groups and projects.

# Don't Eat Extra Oestrogen!

When US and Canadian beef cattle go to intensive mechanized feedlots where they are fattened up before slaughter, hormone pellets are implanted under the skin of the ears. The process is repeated midway through their 100-day fattening period. The hormones increase the weight of the cattle, adding about \$80 profit per animal.

The most common hormone in current use is oestradiol, a potent cancer-causing and gene-damaging oestrogen. The US Food and Drug Administration (FDA) maintains that residues of oestradiol and other hormones in meat are within "normal" levels, and has waived any requirements for monitoring and chemical testing.

The European Union, however, has rightly viewed these claims with great scepticism. Since 1989, it has forbidden the sale of beef from hormone-treated cattle. The opening of markets worldwide to "free trade" has now placed that ban under attack.

On February 17 this year, a panel of World Trade Organization judges began closed hearings on a US and Canadian challenge which charged that the European ban is merely protectionist and cost North America over \$100 million a year in lost exports.

The main basis of the US and Canadian action against Europe is the endorsement of the FDA's safety claims in a 1987 report produced by two UN bodies, the Food and Agriculture Organization and the World Health Organization. The joint committee that prepared this report, however, had minimal expertise in public health and a high representation of veterinary scientists, senior FDA and US Department of Agriculture (USDA) officials, and industry consultants. Relying heavily on unpublished industry information and outdated scientific citations, the committee claimed that hormone residues in legally implanted cattle are so low that eating treated meat could not possibly induce any hormonal or carcinogenic effects.

Confidential industry reports to the FDA, however, obtained under the Freedom of Information Act, reveal high hormone residues in meat products even under ideal test conditions. Following a single ear implant in steers of Synovex-S, a combination of oestradiol and progesterone, oestradiol levels in different meat products were as much as 20 times higher than in untreated steers. The amount of oestradiol in two hamburgers eaten in one day by an 8-year-old boy could increase his total hormone levels by as much as ten per cent, based on conservative assumptions, because young children have very low natural hormone levels.

Exposure in real life may be even higher. An unpublicized and unpublished random USDA survey of 32 large feedlots found that as many as half the cattle had visible illegal "misplaced implants" in muscle rather than under ear skin. This would result in high local concentrations of hormones and elevated levels in all muscle meat. Such abuse is very hard to detect.

Responding to European concerns, the USDA recently claimed that, based on standard residue monitoring programmes, drug levels in violation of regulations have not been detected in meat products. This would seem to be a true statement — because of the 130 million livestock animal commercially slaughtered in 1993, not one was tested for oestradiol or any related hormone.

Meat which is not treated with hormones is currently hard to find in North America and is relatively expensive. If it were widely produced and available, the price would come

down. At the least, meat produced from hormone-treated animals should be explicitly labelled.

These hormones are linked ever more closely to the escalating incidence of reproductive cancers in the US since 1950 — 55 per cent for breast cancer, 120 per cent for testicular cancer and 190 per cent for prostate cancer. The endocrine-disruptive effects of oestrogenic pesticides and other industrial food contaminants known as xeno-oestrogens are now under intensive investigation by federal regulatory and health agencies. But the contamination of meat with residues of the far more potent oestradiol remains ignored.

The WTO judges ought to listen to a top FDA official involved in meat safety, David Livingston: "Well, if you're going to have enough inexpensive meat for everyone, you're going to have to use some of these drugs. But personally, I'd rather eat meat that was raised without them." In other words, what's good enough for the rest of us is not something he wants to eat. None of us should eat extra oestrogen. Instead of forcing Europe to open its markets to North American beef, why not just stop implanting hormones in American cattle?

A preliminary report by the World Trade Organization judges, which has not been made public, has ruled against the European ban. This decision will certainly be appealed against. Irrespective of legalities, however, European consumers have made it clear that they will boycott hormonal meat.

Samuel Epstein

Dr Samuel Epstein is professor of environmental and occupational medicine at the University of Illinois School of Public Health and Chair of the Cancer Prevention Coalition in Chicago. This editorial first appeared in *The Los Angeles Times*.

## Notice to Readers New Editors

This is the last issue of *The Ecologist* edited and produced by the current editorial team, Sarah Sexton and Nicholas Hildyard, who will both be leaving *The Ecologist* at the end of June. Tracey Clunies-Ross, who works with *The Ecologist* on agricultural and biodiversity issues, will also be leaving. We very much appreciate all the support and feedback *Ecologist* readers have given the team over the years.

The proposed new editorial team is John Page, Steve Gorelick, Zak Goldsmith and Helena Norberg-Hodge of the International Society for Ecology and Culture, with Edward Goldsmith resuming an active role in editorial.

Until further notice, correspondence to *The Ecologist* should continue to be sent to the current address, addressed to Sally Snow: The Ecologist, Agriculture House, Bath Road, Sturminster Newton, Dorset DT10 1DU, UK.

Sarah, Tracey and Nick are setting up a new organization to build on their work at *The Ecologist*, particularly research, advocacy, building links and solidarity. They can be contacted at a different address: Corner House, Station Rd, Sturminster Newton, Dorset DT10 1BB, UK.

# The Barons of Bromide

## The Corporate Forces Behind Toxic Poisoning & Ozone Depletion

by

Joshua Karliner, Alba Morales and Dara O'Rourke

*The pesticide methyl bromide poisons farm workers and communities and destroys the ozone layer. A broad coalition, encompassing local communities, farm workers, environmentalists and health professionals, are working for the chemical's rapid and total phase-out worldwide and its replacement by sustainable agricultural practices. Methyl bromide's manufacturers and their associates, however, are lobbying hard at local, national and international levels to keep the chemical unregulated for as long as possible. In the process, they are having a profound effect on democracy.*

Methyl bromide is a highly-toxic, colourless, odourless chemical. It began to be heavily used in agriculture in the 1970s after other hazardous pesticides such as DDT were banned; today, it is used primarily to fumigate soil before crops are planted—injecting methyl bromide gas into the ground kills a wide spectrum of soil pests including nematodes, insects and pathogens.<sup>1</sup> Soil fumigation accounts for 71 per cent of worldwide sales of methyl bromide.<sup>2</sup> Five crops account for over half methyl bromide's use worldwide to fumigate soil: tomatoes, strawberries, peppers, ornamental flowers and tobacco.<sup>3</sup> The chemical is also used before planting grapes, almonds, melons, forest tree seedlings and walnuts. "It's almost the perfect pesticide," comments Jim Wells, director of the California Department of Pesticide Regulation. "With one application you can kill weeds, insects, rodents . . . You name it."<sup>4</sup>

Industrialized nations currently account for more than 80 per cent of global methyl bromide consumption, although the proportion is gradually shifting towards less regulated Third World markets.<sup>5</sup> The United States is by far the largest producer and consumer of the chemical, accounting for approximately 40 per cent of global consumption. US agribusiness and small growers consumed 43.5 million pounds of methyl bromide in 1994.<sup>6</sup> The states of Florida and California are the largest users of the chemical in the country; Florida accounts for almost 40 per cent of pre-plant uses, California 36 per cent.<sup>7</sup>

The features which make methyl bromide "almost the perfect pesticide" — its high toxicity to pests and its ability to penetrate fumigated substances — also increase its toxicity to humans. Exposure to methyl bromide can cause acute damage to the central nervous system, lungs, kidneys, eyes and skin.<sup>8</sup> In their "risk assessment" research, scientists have not found a dose of methyl bromide low enough for them to deem "safe".<sup>9</sup> Many schoolchildren, farm workers and residents near fumigated fields report severe headaches, blurred vision, nausea and

dizziness from exposure to methyl bromide. Nearly half of all reported illnesses due to methyl bromide occur as a result of accidental drift from agricultural fields and fumigated structures.<sup>10</sup>

Methyl bromide is also a major ozone depleter. A recent UN report states that, with CFCs now being phased out, the elimination of methyl bromide emissions "from agricultural, structural and industrial activities" is the single most important step that the world's governments can take today to reduce future levels of ozone depletion.<sup>11</sup>

Because of its toxicity and role in ozone depletion, a broad coalition of local communities, environmentalists, farm workers, labour unions, scientists, public health professionals, consumers' organizations, educators, some government officials and others are fighting for methyl bromide's rapid and total phase-out and for sustainable agricultural practices to replace it. Farm worker-led organizations such as *Lideres Campesinas* — a group of women from 15 different California communities — are striving to educate those in the fields about the risks associated with pesticides such as methyl bromide. The United Farm Workers union, in tandem with the AFL-CIO (the core organization of the US labour movement), has launched a campaign to unionize the 15,000 strawberry workers in the Watsonville-Salinas region of California in one of the largest labour organizing drives in the country.<sup>12</sup>

### The Barons of Bromide

Fighting to keep the chemical on the market, however, is a powerful lobby of chemical corporations and agribusinesses. According to *Chemical Marketing Reporter*, "the global bromine industry is an oligopoly controlled by Albemarle, Great Lakes and the Dead Sea Bromine Group."<sup>13</sup> These three corporations control roughly 75 per cent of global production of methyl bromide.<sup>14</sup> Albemarle, a spin-off from the Ethyl Corporation since 1994, and the Great Lakes Chemical Corporation are both based in the United States; the Dead Sea Bromine Group is a Tel Aviv-based subsidiary of Israel Chemicals.

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## Poisoning in California

The use of methyl bromide in California has risen rapidly in recent years. It jumped from 49 types of applications in 1971 to 109 uses in 1992. This increase was driven largely by more stringent regulations and bans on broad spectrum, persistent pesticides such as aldrin and DDD in 1971, DDT in 1972, dibromochloroethylene (DBCP) in 1981, ethylene dibromide (EDB) in 1983 and chlordane over 1976-1987. As

agricultural activist Will Allen and his colleagues note:

"methyl bromide has become the chemical of choice for high dollar California growers and structural applicators who have lost their other fumigant tools due to environmental and health regulations."

The strawberry industry is California's largest user of pesticides. Strawberries consume more than 25 times as much pesticide as lettuce and 50 times more than grapes. Strawberry fields are covered with pesticides at the average rate of about 300 pounds per acre. Half of this volume consists of methyl bromide.

In addition, large shipper-cooler corporations such as Driscoll use



*Roberto, a 14-year-old immigrant from the Mexican state of Oaxaca, works in the strawberry fields of grower Jaime Rocha.*

methyl bromide to fumigate greenhouses before planting strawberry seedlings. They apply methyl bromide again to those berries destined for Japan and Australia once they are harvested. This triple-dosage makes the California strawberry industry one of the largest single methyl bromide users anywhere in the world.

Poisoning is also high. Overall, between 1982 and 1993, California physicians reported 454 cases of methyl bromide poisoning. Of these illnesses, 282 occurred due to agricultural applications and 172 in structural fumigations. At least 19 deaths were attributed to residential methyl bromide fumigation in California during the same period. A large number of methyl bromide poisoning victims are people of

those poisoned are Latino farm workers, often undocumented labourers from Mexico and Central America, who face losing their jobs or deportation, if they report pesticide poisoning.

State and local government monitoring of airborne methyl bromide is lax, despite the threat posed to farm workers, school children and nearby communities.

An official from the Department of Pesticide Regulation admitted that his agency has no real power to monitor methyl bromide emissions. The Department is dependent on landowners to grant permission to monitor and companies to tell them where and when they will apply the chemical.

colour. During the past decade, thousands of California residents — including large numbers of farm workers residing in work camps — have been evacuated from their homes because of methyl bromide drift from fields.

The true toll, however, is much higher. Victims often mistake symptoms for another malady, while doctors are not trained to recognize or report methyl bromide poisoning. Many of

A number of large agribusiness corporations, such as the Sun-Diamond Growers Cooperative and some large California strawberry corporations like Driscoll, also have an interest in methyl bromide. Another major player is the privately-owned TriCal Corporation, which conducts 60 per cent of its business with methyl bromide and is the largest methyl bromide application company in California.<sup>15</sup>

Together, these Barons of Bromide have been working at local, national and international levels to prevent this acutely-toxic, ozone-depleting chemical from being phased out. Their tactics — expanding the use of their product; undermining alternatives to the product; predicting economic disaster if the product is banned; casting doubt on the product's health and environmental effects; and undermining democracy — are remarkably similar to those used by other chemical companies to keep producing CFCs; by tobacco companies to stave off

cigarette regulation; by petroleum corporations to forestall controls on global warming; and by some of these same companies to keep lead in petrol.

### “Political” Science and Dead Dogs in California

Methyl bromide is currently used to treat over 60 crops in the west coast state of California. Its main use is as a soil fumigant for four crops: strawberries, ornamental flowers, grapes and almonds.<sup>16</sup> The state provides a prime example of how the vested interests in methyl bromide have attempted to influence local politics to their advantage.

Consider the way in which attempts to ban the pesticide under the 1984 California Birth Defects Prevention Act have been thwarted, despite methyl bromide's lethal nature, consid-

## The Poisonous Past

Methyl bromide is a direct descendant of leaded gasoline — a product which used to be produced by the Ethyl Corporation (which spun off its methyl bromide production into Albemarle in 1994) and is still made by a subsidiary of Great Lakes Chemical.

In the early 1920s, scientists perfected a gasoline additive, tetraethyl lead (TEL), that boosted octane content. In 1922, General Motors and DuPont formed a 50-50 joint venture with Standard Oil (today Exxon) to produce and market the chemical. The new company was the Ethyl Corporation.

Other scientists, however, soon raised concerns that automobiles running on leaded gasoline were "a serious menace to the public health". In 1924, it was reported that 80 per cent of workers who produced tetraethyl lead had either been killed or were suffering acute poisoning. At one refinery, employees suffered such severe nerve damage and extensive hallucinations that it was dubbed the "House of Butterflies". Ethyl's product had to be withdrawn from the market, and the Surgeon General set up a panel of scientists to study the problem.

Ethyl, supported by its owners, DuPont, GM and Exxon, fought back,

contradicting a growing body of scientific evidence with a bold public relations and lobbying campaign. The company hired a professor of journalism from Columbia University to place favourable articles in newspapers. DuPont ran full-page ads touting the product in *Life* magazine. Ethyl questioned the scientific basis of banning their product, asking "because some animals die, and some do not die in some experiments, shall we give this thing up entirely?" GM's director of research told the American Medical Association that:

"there is no danger of acquiring lead poisoning even through prolonged exposure to exhaust gases of cars using Ethyl gas."

The campaign was successful. The Surgeon General's panel concluded that "there are at present no good grounds for prohibiting the use of ethyl gasoline". The panel called for specific further studies which were never conducted.

GM went on to push unleaded gasoline off the market by producing engines that ran only on leaded fuel. By 1940, 70 per cent of all US gasoline contained Ethyl's product.

### Exit Leaded Fuel

The disadvantage of tetraethyl lead is

that it leaves a corrosive by-product in the engine. To counter this, Ethyl's scientists came up with the idea of adding ethylene dibromide (EDB) to the gasoline.

Ethyl first produced EDB in 1934 by extracting bromine from seawater in a joint venture with Dow Chemical. This process was replaced in 1969 by a joint venture between Ethyl (no longer owned by DuPont/GM) and Great Lakes Chemical. The new process used concentrated brine extracted from deep below the salt marshes of Arkansas. In the 1960s and 1970s, EDB was Great Lakes Chemicals' main product. Today, both Great Lakes and Ethyl/Albemarle operate major chemical factories in Arkansas producing bromine from salt brine.

When burned, the EDB in leaded gasoline produces methyl bromide. The World Meteorological Organization has determined that the continuing exhaust from automobiles using leaded gasoline is one of the "three potentially major sources of atmospheric methyl bromide".

In 1972, the same year it banned DDT, the US government ordered the phase out of leaded gasoline in the United States. In response, Ethyl and Great Lakes followed a three-track strategy, mirrored today in their fight against the phase out of methyl

erable evidence of toxic impacts on communities and workers across the state, and a variety of organizing efforts over the years. The Act drew up a list of 200 chemicals considered to be potentially carcinogenic or to cause birth defects. Methyl bromide, added to the list in 1986, was near the top. The Act required manufacturers of listed chemicals to submit toxicological studies to the Department of Pesticide Regulation by 1991; the Department would then review the studies and cancel the use of those pesticides that it determined presented "significant adverse health effects".<sup>17</sup>

The methyl bromide studies were to be conducted by Great Lakes Chemical. At the time of the 1991 deadline, five of the required studies were either incomplete or found to have "major deficiencies" by Department scientists.<sup>18</sup> Great Lakes asked for a five-year extension on the grounds of "legitimate scientific disputes" about the impacts of methyl bromide. Its request was granted.<sup>19</sup> As the new deadline of March 1996 loomed, it became clear that three of the toxicology studies mandated ten years before were still not complete. The toxicology studies that were completed found that methyl bromide causes birth defects in rabbits and decreases fertility and fetal birth weights in rats.<sup>20</sup>

Ironically, part of the problem in conducting the tests is that, because methyl bromide is so toxic, it is extremely difficult to conduct any studies on the chemical's long-term impacts,

including its effects on animals' reproductive systems. In one attempt to study the chronic effects of methyl bromide on dogs, scientists could not feed the animals a dose that could be detected without it triggering immediate illness, including seizures that caused the dogs to ram their heads and bodies against the sides of their cages and die within 24 hours.<sup>21</sup>

### Paying Pete for Permission to Poison

In early 1996, just before the second deadline for the toxicology studies, the governor of California, Pete Wilson, called a special session of the California legislature, a manoeuvre usually reserved for earthquakes and floods. Any ban or phase-out of methyl bromide was delayed until the end of 1997 so that "more studies" could be conducted. Wilson himself argued that "if we are to remain a competitive economic force . . . we must act now to prevent the suspended use of methyl bromide."<sup>22</sup>

*The Los Angeles Times* has pointed out that most of Wilson's campaign contributions have come "from major corporations and interest groups with a stake in legislation and regulations decided in [California's state capital] Sacramento". Between 1993 and 1995, Wilson received more than \$500,000 from corporations with strong vested interests in perpetuating the use of methyl bromide.<sup>23</sup>

## A History of Corporate Contamination

bromide. First, they claimed that leaded gasoline emissions posed no human health hazards. Second, they globalized their production and distribution, developing international markets for leaded gasoline. And third, they diversified their production at home.

The replacement of TEL with unleaded gasoline significantly reduced US environmental lead contamination and all of the diseases associated with it. The level of lead in US Americans' blood, for instance, fell on average by 75 per cent. To this day, however, TEL producers continue to question the science. In 1990, for instance, Floyd D. Gottwald Jr., then CEO of Ethyl, today Chair and CEO of Albemarle, claimed that:

"no conclusive scientific evidence has ever linked the use of lead in gasoline to human health problems". Nevertheless, as TEL producers faced a rapidly shrinking market for leaded gasoline in the US and Europe in the 1970s and 1980s, they turned to the Third World. TEL is responsible for nearly 90 per cent of airborne lead pollution in Third World cities today.

International political pressure and the fact that this market is now shrinking (even the World Bank is calling for the elimination of leaded fuel) has spurred most corporations, including Ethyl and DuPont, to stop producing

TEL completely. Today, the only the remaining private sector corporation producing it is Octel Associates, formerly a subsidiary of Ethyl and now owned almost entirely by Great Lakes Chemical. In 1995 TEL accounted for nearly half of Great Lakes' profits.

Ethyl and Great Lakes also sought other domestic uses for their vast brine reserves. Great Lakes focused on EDB's use as an agricultural chemical, for instance, in grain storage silos and as a direct application on crops. In 1983, the US Environmental Protection Agency banned EDB as a pesticide because it posed an unacceptable cancer risk.

Despite this setback, Great Lakes and Ethyl rapidly expanded bromine production. Today, these two corporations make virtually all the bromine produced in the US — one-third of world output. Their bromine product line includes flame retardants, drilling fluids, water treatment chemicals, cleaning solvents, glass making, detergents, inputs to pesticides, photographic chemicals, pharmaceuticals such as ibuprofen — and methyl bromide.

### Enter Methyl Bromide

Methyl bromide is a by-product of a highly-profitable brominated fire

retardant called tetrabromobisphenol-A (TBBA). Great Lakes and Ethyl/Albemarle sell TBBA to the electronics industry to produce fire-resistant circuit boards and personal computer housing.

Great Lakes and Ethyl began producing TBBA in the 1980s when the US government mandated the phase-out of EDB. Instead of considering methyl bromide as a toxic waste by-product of TBBA, it is marketed as a pesticide substitute for the carcinogenic EDB and other banned or severely restricted pesticides. Methyl bromide quickly became a strategic product for Ethyl/Albermarle and Great Lakes.

Today, demand for TBBA is growing rapidly around the world as computer sales expand. The companies are increasing their TBBA production capacity and thus the amount of methyl bromide they generate. When methyl bromide is finally banned, they will either have to incinerate it as hazardous waste (which would create further problems), or eliminate methyl bromide production by making what *Chemical Week* describes as "a small capital investment". They are loathe to do so, however, "because they stand to lose incremental revenue" from methyl bromide sales.

The Sun-Diamond Growers Cooperative has a particularly close relationship with Governor Wilson. A large agricultural concern that uses methyl bromide to grow young fruit trees and to fumigate stored fruit and nuts, Sun-Diamond is composed of four member cooperatives representing growers of walnuts, prunes, raisins and figs. Sun-Diamond's 4,500 members produced nearly \$700 million worth of agricultural produce in 1995.<sup>24</sup> The Cooperative helped Pete Wilson move from being a relatively obscure mayor of San Diego to becoming a US Senator and, finally, Governor of California. As the Cooperative's Senior Vice-President, Richard Douglas, relates:

"We had our neck stuck out for the mayor of San Diego. We raised money for him, we went to bat for him and he won. Pete, after getting elected, came back to thank the Sun-Diamond family time and time again."<sup>25</sup>

Part of that "thanks" appears to have been calling the special session of the California state legislature to keep methyl bromide in the fields of California.

The Birth Defects Prevention Act is still on the statute books in California. The postponed methyl bromide health studies are due in December 1997. Once the industry hands over the studies — something they are finally expected to do — the Department of Pesticide Regulation must then determine whether or not to ban the chemical. Given the corporate influence over the

California state government and the Department, it is unlikely that methyl bromide will be phased out without another major struggle.

### Methyl Bromide Goes to Washington

Whereas the struggle in California has focused on methyl bromide's acute toxicity, national and international initiatives to phase out the chemical have concentrated on its role in ozone depletion. According to scientific consensus, the increase in ultraviolet-B (UVB) radiation triggered by ozone depletion will have significant impacts on human health and the environment, including increased incidence of eye diseases, skin cancer and infectious diseases, and damage to crops and aquatic ecosystems.<sup>26</sup> The 1990 US Clean Air Act Amendments classify methyl bromide as a Class I ozone depleter and, as such, limits its production to 1991 levels and mandates a total phase out by the year 2001.<sup>27</sup>

Under the Clean Air Act, four corporations are currently permitted to produce or distribute methyl bromide at 1991 levels: Great Lakes Chemical, Albemarle, Ameribrom (the US subsidiary of Dead Sea Bromine) and TriCal.<sup>28</sup> These transnationals have formed an industry association, the Methyl Bromide Working Group (MBWG) which is working on a

number of fronts to keep methyl bromide on the market (see Box, below).

While the methyl bromide industry does not exert such a hold over the US President and Congress as it does over California's governor and state legislature — high-ranking members of the Clinton administration are working to ensure that the Clean Air Act's phase-out date of the year 2001 is met — the sway of the Barons of Bromide in US national politics is still formidable.

President Clinton, for instance, has had a long-standing relationship with two of the major methyl bromide producers, Ethyl/Albemarle and Great Lakes Chemical, since he was Governor of Arkansas, the location of both companies' methyl bromide production facilities. As Governor, Clinton supported them as they sought protection from competition posed by the third major producer, Dead Sea Bromine, under the US-Israel free trade pact.<sup>29</sup>

## Industry Tactics

Besides undermining democracy, the methyl bromide industry is attempting to keep its business going in four ways.

### Expanding Methyl Bromide Use

Despite the nationwide freeze in production and its planned elimination in the year 2001, there is still plenty of methyl bromide around and US consumption is rising. The industry trade journal, *Chemical Marketing Reporter*, recently stated that:

"tomato producers used approximately five million pounds of methyl bromide in 1993. In 1994 that figure increased more than five-fold to 27 million pounds. Other crops have seen similar dramatic increases. Potatoes went from an almost undetectable 100,000 pounds in 1993 to seven million pounds in 1994, while pepper and eggplant producers increased consumption from 500,000 pounds to six million pounds during the same time period."

Farmers and agribusiness seem to be switching to or increasing their use of and dependence on a chemical they know will not be available in five years time because they are being led to believe by groups such as MBWG that methyl bromide will not, in fact, be phased out.

In 1995, for instance, less than a week after it was announced that ozone depletion had reached record levels, MBWG chief lobbyist Peter Sparber wrote to growers that "if we continue to work together, we stand an increasingly good chance of being able to use methyl bromide well beyond the year 2001". Sparber noted that this could be achieved by changing the Clean Air Act.

### Undermining Alternatives

In a document that targets agricultural users of the pesticide they produce and sell, the Methyl Bromide Working Group asserts that:

"In the United States and in many other agricultural-exporting nations, growers rely on methyl

bromide to produce and process more than 100 vegetables, fruits, grains and fibres. If farmers had effective alternatives, they would use them."

Viable alternatives do exist for the vast majority of methyl bromide applications. The Methyl Bromide Technical Options Committee (MBTOC), a United Nations committee of 58 scientists, manufacturers, users, government representatives and non-governmental organizations, reported in 1995 that there were "technically feasible" alternatives "either currently available or at an advanced stage of development" for at least 90 per cent of methyl bromide use. Non-chemical alternatives for soil fumigation include crop rotation practices, altering planting times, artificial plant growth substrates, biological control and organic amendments, soil solarization, steam treatments, superheated or hot water treatments, and wavelength-selective mulches. Many of these methods are already employed in countries such as The Netherlands and Germany which have banned methyl bromide.

By persuading growers that methyl bromide stands a good chance of surviving in the future while negating the existence of alternatives, the MBWG is creating disincentives for growers to explore and invest in such alternatives, while locking growers still further into dependence on methyl bromide.

The MBWG has also argued against a proposed tax on methyl bromide — a tax levied on all other Class I ozone depleters in the US — the proceeds from which, an estimated \$1 billion over five years, could be used to develop alternatives to the chemical.

### Predicting Economic Disaster

The MBWG stresses the impossibility of many forms of agricultural production without methyl bromide:

"For American agriculture to survive, American farmers must be able to produce increasingly more crops on less land. And for American farmers to compete, the crops they produce must look and taste good to

consumers. Without methyl bromide, many growers fear they will neither compete nor survive."

Such fear and dependence has largely been instilled by the MBWG. The spectre of international competition from producers in other countries, which will have an "unfair advantage in international markets for the various agricultural commodities produced with the substance", has not led MBWG and the corporations it represents to call for accelerating the international phase-out of the chemical. Instead, they use international economic competition as a scare tactic to attempt to roll back the Clean Air Act and postpone phase-out dates.

### Casting Doubt

"Scientists are increasingly unsure about the role of methyl bromide in ozone depletion . . . Early concerns about methyl bromide were overstated," declares the *Methyl Bromide Bulletin*, published by the MBWG. To reach these "conclusions", the MBWG spent millions of dollars on a joint study it conducted with the US Department of Agriculture which attacked EPA and United Nations findings. The joint corporate-government investigation found that "relatively little is known about where methyl bromide comes from . . . where it goes . . . and what happens to the methyl bromide which escapes to the atmosphere," a distortion that flies in the face of widely accepted and rigorously documented science.

Another misleading argument that the MBWG propagates is that because methyl bromide also comes from natural sources such as the ocean, it is not a significant ozone-depleter. Some 60 per cent of methyl bromide is produced by the sea and is reabsorbed in atmospheric "sinks". But the remaining 40 per cent is industrially produced and cannot be reabsorbed into the environment; in fact, it destabilizes the equilibrium of the natural methyl bromide cycle, leading to ozone depletion.

# The Greening of Hate

## Methyl Bromide and Environmental Racism

A large number of people of colour are poisoned by methyl bromide each year. Hundreds of primary schools, for instance, are near the fields and buildings fumigated with methyl bromide. In 17 of the 20 schools closest to the heaviest methyl bromide use in California, 80 per cent or more of the pupils are children of colour. In the state as a whole, children of colour comprise less than 60 per cent of the pupils. Latino children are the hardest hit; from 65 to 96 per cent of the pupils in all 17 of these elementary schools are Hispanic. Latinos comprise less than 40 per cent of all students statewide.

Many of those poisoned are migrant farm workers, undocumented labourers from Mexico and Central America who already live in appalling conditions adjacent to agricultural fields. As Dolores Huerta, a leader of the United Farm Workers Union, which has been taking a stand against methyl bromide for more than two decades, explains:

"unfortunately, there are not enough records kept of farm workers who are injured by methyl

bromide. God knows how many farm workers have died from methyl bromide. I personally know one family where the woman's husband got sick working in the strawberries in San Diego. He got on a bus and went home and died in Tijuana."

Farm workers face job loss and deportation if they complain about working conditions and are thus forced to choose between their health and their livelihood. "I have seen people at work who do speak up and defend themselves," says Esperanza, a farm worker in Watsonville. "They're the first ones who are fired, or, when the new season starts, nobody will hire them."

Abysmal working conditions, lack of job security and a lack of accurate reporting of the effects of pesticides on people who live and work near agricultural fields all contribute to a pattern of environmental racism in the United States where the economically poor and politically disenfranchised bear a disproportionate share of environmental harm. Immigrant farm workers have been leading the struggle against toxic pesticides for more than 20 years, yet people of colour, particularly migrants,

are increasingly blamed for environmental degradation.

In addition, farm workers find it increasingly difficult to exercise their rights as a wave of anti-immigrant sentiment rolls across the US political landscape. This is despite studies showing that immigrants boost the employment and income of everyone in the United States, and that immigrants today comprise only eight per cent of the population compared to 15 per cent at the turn of the century — even though the whole country has been a nation of "immigrants" for 500 years or so.

The threat of deportation in California has loomed closer with the 1995 passage of Proposition 187 in a special referendum of California voters. Under challenge in court as unconstitutional by a coalition of community groups, including the Mexican American Legal Defense Fund, Proposition 187 requires, among other things, medical personnel, teachers and other service providers to report undocumented immigrants to the Immigration and Naturalization Service.

The relationship between former Agriculture Secretary Mike Espy and Sun-Diamond Growers is another example. In September 1996, a federal jury found Sun-Diamond guilty on eight of nine counts of making illegal gifts to Espy while, as Agriculture Secretary, he was considering the whole issue of methyl bromide. Espy received more than \$9,000 worth of gifts from Sun-Diamond's Senior Vice-President Richard Douglas in 1993-94 when the USDA was considering phasing out methyl bromide.<sup>30</sup> Lawyers for Sun-Diamond, which had reimbursed Douglas for most of his expenses, attempted to convince the jury that the gifts were based strictly on the two men's long-standing "friendship".<sup>31</sup> Mike Espy resigned in late 1994 as questions arose about his relationship with the corporations that the USDA was supposed to regulate.

Meanwhile, a leaked MBWG memorandum, dated 25 September 1996, states that a Chief of Staff of the Clinton administration, Leon Panetta, had been "helpful" to the MBWG's efforts to roll-back or repeal the methyl bromide phase-out. It also directs members of the MBWG to contact Panetta (rumoured to be considering running for Governor of California) by telephone and letters, arguing that he "must continue to help if we are to succeed".<sup>32</sup>

As in California, some bromide corporations have attempted to curry favour with politicians by bankrolling their electoral campaigns. The most generous has been Albemarle Chair and Chief Executive Officer Floyd D. Gottwald Jr. In the four national elections held between 1990 and 1996, Gottwald gave nearly a quarter of a million dollars to mostly Republican

presidential and congressional candidates, as well as to the Republican National Committee.

The MBWG has also attempted to build the appearance of a pro-methyl bromide grassroots movement by rallying methyl bromide users, including shippers, exporters, importers and growers, to lobby for the rolling back of the Clean Air Act. "We've found methyl bromide users in Brooklyn, Philadelphia, in ports and all over the place," says MBWG's chief lobbyist Peter Sparber.<sup>33</sup>

In one example of this "astroturf" (artificial grassroots) lobbying, the Gargiulo corporation, a California strawberry company linked with chemical giant Monsanto, reportedly attempted to coerce its workers into rallying behind methyl bromide. According to a Gargiulo worker, the company held a series of three meetings with strawberry pickers during the first half of 1996 and encouraged them to write letters to President Clinton stating their support for methyl bromide and asking him not to ban it. Reportedly threatening that if methyl bromide were banned most workers would lose their jobs, the company provided a box where workers could deposit their letters. While many workers refused to do so, Gargiulo apparently mailed a number of letters to the President.<sup>34</sup>

If the bromide corporations fail to repeal or at least delay the ban on methyl bromide mandated by the Clean Air Act, they will be aiming for an "essential use exemption" which would allow the continuing use of methyl bromide where it is deemed "essential". Such uses may well include tomatoes and strawberries, the two heaviest users of methyl bromide in the country.

## Organizing Against Poisoning

Karen Light lives in a house which backs on to a strawberry field. She and her neighbours have twice been poisoned by methyl bromide fumes escaping from the nearby fields.

The first time was in October 1993. While the fields behind her house were being fumigated with the chemical, Light received a 'phone call from one of her neighbours.

"She wanted to know if my eyes were bothering me. Her eyes were burning really badly. My eyes had been bothering me, but I thought it was because I was working so hard."

Concerned that their eye irritations were caused by pesticide use in the fields, Light and her neighbours called the Agricultural Commissioner, who checked the fields, decided everything was fine and gave the go-ahead for a second round of methyl bromide fumigation. By the time the fumigation was complete, 14 residents of the neighbourhood adjacent to the treated fields had fallen ill. Says Light:

"Everyone had burning eyes. Some people's eyes were burning so badly they couldn't see at all. Several people had nausea and raspy coughs. One person had a bloody nose, some people had headaches. Two people had diarrhoea. It was obvious that what was happening to us was related to what was going on in the fields."

Only one out of 14 illnesses were recorded as pesticide related:

"My doctor didn't know he was supposed to call the public health officer to report pesticide poisoning. The ag commissioner did not advise him, the poison control centre did not advise him. I called the doctor and told him he needed to call public health, so he did. You can imagine what that means for the state records. These cases basically never get reported."

Despite the fact that many people in the community were showing classic symptoms of exposure to methyl bromide and chloropicrin (the less toxic, strong-smelling tear gas, mixed in with the fumigant, which causes eye irritations), the agricultural commissioner determined that nothing was wrong. Light and her neighbours researched into methyl bromide, wrote to various government officials and won a 48-hour notification whenever methyl bromide was to be used behind their homes.

In July 1995, Light was notified that the fields behind her house were going to be fumigated with methyl bromide. She and most of her neighbours left their homes for the weekend of the fumigation. Upon returning home, Light found the tarpaulin covering the field "torn and billowing really high" and several farm workers picking berries not far from where the plastic had torn. She called the agricultural commissioner to report the tear. A day later, the tarpaulins had not been repaired. Light called the agricultural commissioner again.

"They said 'we're taking care of it.' Finally, I realized that by 'taking care of it' they meant protecting their investment, and that the growers were busy looking into refumigating the section where the tarp had been torn."

"After the second poisoning, I realized it was up to us to take action," explains Light. In 1995, Light met Marilyn Garrett, one of several teachers who had been organizing against pesticide use near schools for a few years. Light and Garrett met with others concerned about pesticide drift, and Farm Without Harm started in October 1995. The group of parents, teachers and community members meets regularly to educate themselves and others about the dangers of pesticide drift and to prevent harmful pesticide exposure. Many people who attend the meetings have histories of respiratory problems and asthma. The group is documenting the health effects of pesticides and monitoring drift. Says Light:

"It's ironic, we couldn't get any testing after we were poisoned because the only people who had test equipment were the fumigators. The ag commissioner had no testing equipment. The County Air Resources Board couldn't do testing because Governor Wilson had disallowed air testing for agricultural poison. But when we say we're being poisoned everyone says 'No, you're not.' So we're doing the testing ourselves."

One of Farm Without Harm's broader goals is to "reduce the use of pesticides and promote sustainable agriculture." The group urges concerned people to buy organic produce and support growers using sustainable farming methods, to write to their legislators on issues of pesticide use, and to join groups trying to ban pesticides.

Rural communities are not the only ones affected by methyl bromide drift.

Sonia Rodriguez, who has lived for nine years in Barrio Logan, an 80 per cent Latino community in south-east San Diego, has been fighting against the poisoning of her urban community. She is active with a community group called SALTA (Salud Ambiental, Latinas Tomando Acción — Environmental Health, Latinas Taking Action — a project of the Environmental Health Coalition). The Tenth Avenue Cold Storage Facility of the San Diego Port District fumigates commodities that arrive at its docks with methyl bromide; the chemical is then vented directly into the air. Close by the Facility is an elementary school of 700 children, 93-94 per cent of whom are Latino, 2-3 per cent African American and 2 per cent Caucasian. Rodriguez says that asthma and recurring eye infections are common in her neighbourhood.

"The Port District has been closed to the concerns of the Barrio Logan community," says Diane Takvorian of the Environmental Health Coalition. "Other bayfront communities are treated with much more respect than those that are low-income people of colour communities."

The Coalition and the San Diego Unified School District filed two lawsuits against the Port District to stop the storage facility's methyl bromide emissions. A settlement was reached which included restrictions on when methyl bromide fumigation could take place, limits on the quantity of the chemical to be used, a mandate to set up monitoring equipment and take air samples, a call for better community notification, and a requirement that the Port set up a methyl bromide recapturing unit.

Today residents are notified of fumigation dates, but often at the last minute. Methyl bromide fumigations occur outside the agreed hours of 6 o'clock in the evening until midnight. Monitoring procedures are faulty. The installed recapture unit does not work.

Despite these frustrations, Barrio Logan residents have seen progress. The women who participate in SALTA have gained valuable knowledge which they take back to their families and neighbours. SALTA members are vocal leaders in neighbourhood actions and protests. Barrio Logan residents have combined self-education and public action to understand the environmental problems confronting them.

## The Globalization of Methyl Bromide Politics

At the international level, progress in controlling methyl bromide so as to protect the ozone layer has been limited. The chemical was first officially identified as an ozone depleter in 1991 and listed as such by the Montreal Protocol on Substances That Deplete the Ozone Layer in 1992. At the Protocol's seventh meeting in Vienna in December 1995, governments agreed to end methyl bromide production in the "developed" nations by the year 2010, a decade later than US Clean Air Act mandates.<sup>35</sup>

Another industry association, the Methyl Bromide Global Coalition (MBGC), which is composed of just six methyl bromide producers and TriCal and is chaired and coordinated by plant pathologist Dr Tom Duafala of TriCal, is trying to prevent a global phase-out.<sup>36</sup> Attempts to influence the Montreal Protocol take the form of lobbying national governments, usually behind closed doors and usually prior to Protocol meetings.

Delegates and other participants in Protocol meetings report that the corporate presence is obvious in the discussions, especially the private meetings that form part of the international negotiations. Most conspicuous is the close relationship between the bromide companies and the representatives of governments from a handful of nations. "When you go to the meetings, you see how close they are," says Anne Schonfield, an analyst with the Pesticide Action Network. "They're constantly talking, they're constantly meeting, they're constantly saying the same things."<sup>37</sup>

The greatest inroads that the MBGC and its allies have made are with a few governments from southern Europe, such as Italy, and Africa, most notably Kenya, which uses about ten per cent of all the methyl bromide consumed in Africa.<sup>38</sup> In 1994, the Kenyan delegation was interested in putting forward a "Nairobi declaration on methyl bromide" to show that the country could provide international leadership in dealing constructively with environmental problems.<sup>39</sup> When the methyl bromide industry learnt of this, they unleashed a whirlwind of lobby activity on the Kenyan delegation. Individual Kenyans were hauled out of meetings and "spoken to" by several industry representatives in the corridor. Kenya dropped the declaration and its position on methyl bromide has since changed completely. At the May 1995 Montreal Protocol meeting, for instance, Kenya claimed that further controls on methyl bromide would have minimal effects on the ozone layer, doubted that alternatives would be appropriate for developing countries, and totally opposed controls on the chemical in developing countries. They strongly encouraged other countries to oppose controls too.<sup>40</sup>

The Methyl Bromide Global Coalition has also distorted scientific findings to suit its goals. It circulated alleged "conclusions" of a scientific meeting called "Methyl Bromide State of the Science Workshop" held in June 1995. The "conclusions" were not the workshop's findings, but a paper authored by MBGC chair Duafala — although his name and that of the MBGC did not appear on the first version circulated. This document included unfounded claims such as "increasing agricultural use of methyl bromide has had no measurable affect on atmospheric levels."<sup>41</sup> Government officials in a number of countries were led to believe that this summary had been approved by the United Nations and independent scientists.

The industry has also had a substantial impact on the assessment of alternatives made by UNEP's Methyl Bromide Technical Options Committee (MBTOC). Of the 58 members of the

1994 Committee charged with "addressing the technical availability of chemical and non-chemical alternatives," 38 per cent are corporate representatives. Of these, nearly half are delegates of companies actively involved in lobbying for the perpetuation of methyl bromide use on a global scale.<sup>42</sup> The MBTOC report gave a more pessimistic picture of alternatives than is the case.

The methyl bromide industry also commissions and funds scientists and scientific consultants to carry out research, produce technical papers, speak at public meetings and attend scientific panels. All of this undermines legitimate, independent ozone science. In many of these venues, the bromide corporations attempt to move discussions away from replacing methyl bromide with more ecologically sustainable farming, transport and structural maintenance techniques. Instead, they tout an "end-of-the-pipe" approach to reduce but not eliminate emissions. If the Montreal Protocol and UN member governments invest resources in end-of-the-pipe solutions, few funds will be available for pollution prevention alternatives.

In spite of all their efforts, however, companies assume that the chemical will eventually be phased out in the Northern industrialized nations. They are thus lobbying hard for the Montreal Protocol to institute a later phase-out date for Third World countries while simultaneously circumnavigating the globe to create thriving methyl bromide markets throughout Asia, Africa and Latin America, in particular, Mexico, Kenya, Morocco, Jordan and China. Global methyl bromide sales increased by more than 50 per cent from 1984 to 1992, growing from roughly 45,000 tonnes to more than 75,000 tonnes.<sup>43</sup> As in the North, the chemical is rarely used on staple food crops in the South; instead it is applied to cash crops, such as strawberries, and export crops, such as tobacco and fresh flowers. In Zimbabwe, it is used on 98 per cent of the tobacco seedbed area; tobacco accounts for about 25 per cent of the country's export earnings.<sup>44</sup> Dead Sea Bromine and Great Lakes Chemicals have helped ensure that the use of methyl bromide for soil fumigation in China has grown from roughly 40,000 pounds in 1991 to more than 700,000 pounds in 1995 — a nearly 18-fold increase.<sup>45</sup> Rumours abound of plans to build factories to produce methyl bromide in countries like Jordan and Kenya.<sup>46</sup> TriCal has reportedly created a Mexican subsidiary, TriCal de Baja California.

## Alternatives to Corporate Rule

A ban on methyl bromide presents a danger and an opportunity. The danger is that once methyl bromide is banned, it will be replaced by another series of chemicals which are still hazardous to workers and the environment. This would be in keeping with a long corporate history of replacing one socially and environmentally destructive product with another. It would also ensure that modern agriculture remains hooked on hazardous chemical inputs and transnational chemical corporations to supply them. TriCal is already trying to capture the California fumigation market for a major substitute, Telone (1,3, dichloropropene), produced by Dow-Elanco, which is so hazardous that its use is severely restricted in California.

The opportunity is for agriculture to step off the pesticide treadmill. The lack of a broad spectrum fumigant to replace methyl bromide boosts the case for a diversity of alternatives which non-chemical ecological agriculture thrives upon.

The methyl bromide corporations' influence on politics in California, the US and at the international level have proved

as poisonous to democracy as the chemical is to the environment and human health. To confront and reverse this influence, the challenge is to work locally, nationally and globally simultaneously. Such a multilevel approach, although daunting, is necessary if ecological sustainability and social justice are to triumph over the interests of a few profit-hungry corporations. Such a task is intimately intertwined with the broader challenge of building greater democratic control over corporations at these three levels.

If transnational corporations are not subordinated to the public interest, if they are not forced out of the political arenas in which they operate virtually unhindered, if they are permitted to produce such heinous substances as methyl bromide in the first place, if they can regularly globalize the problems they create, and if they are allowed to continue to have such profound

influence over political processes at every level, then banning methyl bromide alone would be an isolated victory.

Fundamental change will occur when a broad-based, diverse and far-reaching global movement emerges to demand it. Working to ban methyl bromide and to switch to ecologically-sound agriculture provides an opportunity to build such a movement. Farm workers, immigrants, local communities and labour unions fighting for social and environmental justice have thus come together with national and international environmental groups concerned about ozone depletion to push for the immediate ban on methyl bromide.

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# Crude Operators

## The Future of the Oil Industry

by

Andrew Rowell

*Technological advances and the maturity of existing oil fields have spurred oil companies to explore for oil and extract it from previously inaccessible or "frontier" areas, both offshore and onshore. In many cases, such prospecting and production will have severe environmental impacts and serious social, ethical and cultural consequences. The challenge is not just to halt such exploration and extraction, but to halt oil consumption itself.*

The twentieth century has been the age of oil. In the past one hundred years, the Western world has become dependent on oil and, increasingly, gas (which has replaced coal as a major source of commercial power generation and electricity for domestic heating and cooking). The motor car is one of the main users of oil. Over the last ten years, 132 million cars have come onto the world's roads. OECD countries currently have car ownership rates of 494 vehicles per 1,000 people, non-OECD countries 23 per 1,000.<sup>1</sup>

To many countries, oil is black gold: a resource to be exploited as economically and expediently as possible. Oil and gas have been discovered in around 90 countries, but nearly two-thirds of the world's oil reserves are in the Middle East. Western nations with reserves, such as Britain and Norway, have found it an easy cash resource to offset against popular spending commitments on health and education. Many developing nations — Indonesia and Venezuela, for instance — have used their reserves to fund rapid development programmes. The driving force behind the industry, however, is the seven largest private oil companies: Amoco, BP, Chevron, Exxon, Mobil, Shell and Texaco.

As long as the world continues its love affair with the motor car — specifically the petrol-driven internal combustion engine — the oil industry believes its future is guaranteed. Amoco, for instance, predicts that transport, which currently accounts for half of current oil consumption, will account for two-thirds of future growth. Recent indications are that by the year 2006 there will be one billion vehicles worldwide.<sup>2</sup> Car ownership in the Asia-Pacific region is set to rocket from 25 million in 1995 to 70 million by the year 2010, fuelling a demand for oil faster than anywhere else in the world. China's annual demand for transport fuel is set to increase from 47 million tonnes to 120 million tonnes by the year 2010.<sup>3</sup>

Worldwide, demand for oil is set to increase in 1997 for the fourteenth consecutive year to an average of 73.7 million barrels per day.<sup>4</sup> Over the next ten years, global production of oil is expected to rise by nearly 24 per cent and of gas by 40 per cent.<sup>5</sup> Shell believe that demand for oil could increase by two-thirds by the year 2020 and demand for gas double.<sup>6</sup>

Industry leaders are thus upbeat about their prospects well

into the next millennium. Executives in Shell, for instance, are "girding our loins for our second century" because "the importance of oil and gas is likely to increase rather than diminish as we enter the twenty-first century".<sup>7</sup> "This is an industry with a future", said Sir David Simon, until recently Chair of BP.<sup>8</sup> "This is an industry that knows how to react when the going gets rough." Head of Mobil Lucio Noto adds:

"Many people have tried to sink this industry, but they have not succeeded because it does one hell of a good job of providing goods and services that are absolutely essential to making the world go around. The future is probably brighter than it has been for quite some time."<sup>9</sup>

### Where's It All Coming From?

Yet oil is a finite resource. At current rates of consumption, known reserves of oil in 1995 (some 1.01 trillion barrels of oil or 137 billion tonnes) were expected to last for 43 years and reserves of gas (63.2 trillion cubic metres) for 65 years.<sup>10</sup>

There is more to be discovered, however. Exxon believe that only one trillion barrels of oil equivalent has been used out of a total available 4.7 trillion.<sup>11</sup> The US Geological Survey estimates that up to 2.1 trillion barrels of oil could ultimately be produced economically worldwide, which could sustain the current rate of consumption for another 95 years.<sup>12</sup>

Recent technological advances — three dimensional (3-D) seismic testing, improved directional drilling and sub-sea and floating production facilities — mean that more and more oil can be recovered from existing reserves.<sup>13</sup> In offshore Norway alone, new techniques will recover an estimated 3.1 billion barrels of oil from existing fields.<sup>14</sup>

But most of the larger fields in traditional areas of production such as Alaska and the North Sea are reaching maturity, and no new substantial production areas have been found in recent years. Thus the search for more oil has moved into previously inaccessible or "frontier" areas, both offshore and on land. The oil majors are leading this frontier search. A recent survey of the top 228 oil and gas companies showed that they have significantly increased their exploration and production in 1997; spending was up by 15 per cent over 1996, the greatest increase for nine years. Expenditure on exploration by the top 105 companies outside the US is expected to increase this year by 16

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per cent to \$50 billion.<sup>15</sup> According to Shell, the capital investment needed for the oil and gas industry could be \$250 billion a year, in the period 2000-2020, much of it in non-OECD countries. The gas industry needs investment of \$1,000 billion by the year 2020.<sup>16</sup>

## Out to Sea

Most recent expenditure has focused on offshore exploration where the industry is drilling in ever deeper and more pristine waters.

The frontier offshore areas in Europe are the Atlantic Ocean west of Shetland, Ireland and Norway. Undiscovered reserves west of Shetland are estimated at up to 15 billion barrels.<sup>17</sup>

The first field to come on-stream in this frontier area, BP's Foinaven field in depths of water of 400 to 600 metres (1,970 feet), will be exploited using a floating production, storage and offloading vessel starting this summer (The largest steel structure at present installed in the British North Sea is BP's Magnus field in 600 feet of water). The BP/Shell consortium, whose second field in the region, Schiehallion, is due to come on stream in mid-1998, recently announced a third discovery, Suilven.<sup>18</sup> Texaco will also drill two wells in the Atlantic region this year, hoping to find sufficient gas reserves to warrant the development of a regional gas network.<sup>19</sup> Mobil is pushing drilling technology to new limits by drilling to water depths of 4,500 to 5,000 feet (1,500 metres), 70 miles northwest of the Shetland Islands in harsher conditions and stronger currents than BP's Foinaven field.<sup>20</sup>

The deep waters of the Gulf of Mexico, meanwhile, have been labelled as the "most exciting offshore province in the world".<sup>21</sup> Excitement is such that \$1.24 billion was bid by oil companies in the latest licensing round from the US government. Leading the bidding was Shell, currently the biggest deepwater player in the Gulf with interests in some 440 leases at depths of over 1,500 feet.<sup>22</sup> In the Gulf of Mexico, as elsewhere, much of the interest is in oil at water depths which were physically and economically impossible to explore and extract until recently. Conoco has unveiled plans to spend \$200 million developing a ship that will drill and produce in the Gulf's "ultradeepwater" — water depths of 10,000 feet (3,000 metres).<sup>23</sup>

The successful application of these new technologies in the Atlantic and the Gulf of Mexico has prompted governments in Asia and West Africa to offer vast acreages of their offshore territories for exploration.<sup>24</sup> Recent discoveries have been made in deepwater offshore Angola and Nigeria.<sup>25</sup> In Asia, much of the exploration is in offshore Indonesia where \$42 billion is now being spent by Exxon and Pertamina on the Natuna LNG project, the largest undeveloped hydrocarbon resource in South-East Asia. Elsewhere, Thailand, Vietnam and the South and East China Seas are buzzing with activity.<sup>26</sup> In Burma, development is concentrated on two offshore gas fields in the Gulf of Martaban. The Yadana field is operated by Total/Unocal, and Thai and Burmese state oil companies, which will export gas to Thailand. The Yetagun field is run by Texaco, Nippon Oil and UK Independent Premier which has recently negotiated to sell gas to Thailand as well. Both consortia will rely on pipelines being built to Thailand through rainforest and ethnic areas with severe cultural, civil rights and environmental consequences. Offshore Western Australia is also seeing a revival with Perth

on the verge of becoming a boom oil city.<sup>27</sup>

The oil companies are also using their experience gained from existing fields in the Northern hemisphere to explore ever deeper waters, colder climates and harsher environments. Experience gained in offshore Alaska is now being exported to Siberia, while lessons learnt in the North Sea are now being applied to the Falklands, where the first exploratory well in water depths of 150-350 metres (1,150 feet) will be drilled by Amerada Hess, Lasso and Shell next year.<sup>28</sup>

Some people in the industry see no technological limits to exploration. "Beyond land and sea, innovative minds in the petroleum industry are close to cracking the ice barrier," says James Crump of the World Energy Group at the accounting and financial group, Price Waterhouse. "Northern Canada, the Barents Sea, Greenland and even the world's poles may become regions where resource development is no longer uneconomical and unfeasible".<sup>29</sup> Whether it is politically feasible, however, is another matter.

## Into the Interior

On land, a high proportion of the frontier exploration areas are in the Arctic, tropical forests and riverine deltas. Prospecting in the former Soviet Union is booming, with Azerbaijan set to become one of the world's most active exploration and production areas. BP plans to spend up to \$10 billion on a 30-year deal with Azerbaijan to drill a four billion barrel oil concession in the Caspian Sea.<sup>30</sup> Foreign investment in Kazakhstan's oil and gas for 20-year licences reached \$80.1 billion by the end of 1995. Development in this republic centres on Chevron's Tengiz field which has reserves of up to nine billion barrels of oil.<sup>31</sup>

In Latin America, liberalization of the largely state-owned oil industry is also revolutionizing the region. Trade journal *World Oil* describes the area as the current "investment target of the world".<sup>32</sup> The Brazilian state oil company, Petrobras, recently announced 200 "strategic partnerships" for private companies.<sup>33</sup> Venezuela's state oil company, PDVSA, is embarking on a \$60 billion, ten-year campaign to increase oil output — with 40 per cent coming through alliances with other oil companies.<sup>34</sup> Argentina has become the principal focus of US company investment, while British companies such as BP and Shell have been focusing on operations in Colombia and Peru. Says Bill Perkins, Chevron's South American General Manager, "This could be one of the more memorable great feeding frenzies in the history of the oil industry."<sup>35</sup>

## More Ogonilands?

The new oil and gas exploration and potential extraction now taking place around the world will, in most cases, have severe environmental impacts and serious social, ethical and cultural consequences.

The offshore Atlantic frontier, for instance, is "among the richest habitats in Europe for whales". Some 22 species of whale, porpoise and dolphin have been recorded in the area, which is also rich in birdlife and coral.<sup>36</sup> In response to environmental criticism, BP, Shell and the other oil companies in the area have set up the Atlantic Frontier Environmental Forum, ostensibly to facilitate discussion on the environmental effects of their activities.<sup>37</sup> The companies are also funding research

# The Ecological Impacts of the Oil Industry

Oil pollutes throughout its life cycle, from exploration to production to refining to transportation to consumption.

The first step in the oil cycle is seismic testing: by means of vibrations or explosions, scientists can interpret the ground's underlying geology to determine the probability — but not certainty — of finding oil there. The ecological impacts of seismic testing are related to the effects of sending out the signals.

Offshore, water carries sound much better than air. The shockwaves of seismic testing kill marine life. In the Beaufort Sea in Alaska, airguns have produced sound levels of 245 to 250 decibels — the human pain threshold is 140 decibels. Grey and sperm whales in the Sea are being driven away from their waters by seismic prospecting. In the Gulf of Suez, turtles have been killed by the shockwaves in the water.

After seismic testing, and before drilling can start on previously inaccessible areas such as tropical rainforests and polar regions, roads need to be built. These invariably lead to settlement, logging and mining. The World Bank estimates that for each mile of new road built by the oil industry, 400 to 2,400 hectares of land are colonized.

In Ecuador, pollution combined with loss of land and infestation of new diseases by colonists have devastated the local indigenous peoples since oil companies began exploring and producing oil in the rainforest two decades ago. The population of the Cofan peoples has been reduced from 70,000 to 3,000 in just 30 years.

Pollution — onshore, offshore and atmospheric — is obviously a major result of the search for oil. During Texaco's 20 years of production in Ecuador from 1972 to 1992, it spilled 16.8 million gallons and left 600 toxic waste pits. Shell's own figures indicate that since 1989 there have been 190 oil spills a year in Nigeria. An environmental survey carried out by the company found oil concentrations in a local creek to be similar to water sampled when the oil tanker Braer ran aground off Shetland in January 1993.

As a result of drilling for oil, some 55,000 tonnes of oil are released each year into drill cuttings and

muds, contaminating them with potentially toxic metals such as arsenic, cadmium and mercury. Water is usually extracted along with oil and gas — over the life of a field, there can be ten times more production of water than of oil. The contaminated water, however, is a toxic waste which can have a profound effect on the surrounding environment.

Since 1972, oil companies have dumped over 19 billion gallons of untreated toxic production wastes in the Ecuadorian rainforest. Some production wastes are radioactive because of naturally-occurring radioactivity underground. In Louisiana, for instance, production water was more radioactive than effluent legally discharged from a nuclear power plant.

Most oil extracted has gas associated with it; if it is not economical to sell the gas, it is burnt off upon extraction without any pollution control. In Ecuador, 53 million cubic feet of gas is flared every day. Gas flaring causes local pollution as well as global warming. Up to 76 per cent of gas extracted in Nigeria is flared (compared to 4.3 per cent in the UK); much of the flaring takes place close to villages.

Worldwide there are approximately 700 oil refineries, which also cause spillages and create air and water pollution. At Amoco's Whiting refinery in Indiana, US, a permanent layer of oil floats on top of the city's groundwater.

Oil refineries are significant sources of sodium dioxide, nitrogen oxide and other air pollutants. Refineries also pose serious health and safety risks. In January 1992, an explosion at Texaco's Pembrokehire site in Wales injured 18 employees. Nine months later, 17 people were injured when an explosion rocked the company's refinery in Los Angeles.

Oil is one of the most widespread pollutants in the sea. Figures vary as to the extent of this pollution. Spills from the tankers Braer and Exxon Valdez, which ran aground in Prince William Sound in Alaska in 1989, totalled 160,000 tonnes — just six per cent of the 2.5 million tonnes of oil entering the sea every year. In February 1996, the Sea Empress spilled over 70,000 tonnes of Texaco's oil off the Pembrokehire coast. Many smaller spillages, including routine discharges from vessels and marine terminals of bilge and fuel oil, never hit the news headlines.

Despite the oil industry's propaganda, oil spills have more than short-term effects. Spills from the Exxon Valdez killed more wildlife than any other oil spill. Five years later, many local bird, fish and animal species showed little sign of recovery.

Clean-up technologies used in the aftermath of oil spills can sometimes do more harm than good. In Alaska, for instance, pressurized hot water hosing and the use of fertilizer after the Exxon Valdez spill caused severe damage to both wildlife and clean-up workers.

The problem of what to do with all the various oil infrastructures once a field is exhausted or no longer commercially viable or when the structure is too old hit the headlines in 1995 when Shell announced that it proposed to dispose of a decommissioned oil storage buoy, the Brent Spar, at sea. Thousands of operating platforms worldwide will one day have to be taken down or toppled. In the British North Sea, some 155 structures (along with thousands of miles of pipeline) will have to be removed. Some of these rigs are larger than a 30-storey building, and the economic costs — let alone the environmental ones — of their disposal are high. In the case of the North Sea alone, the removal of all 155 structures will cost an estimated £4.4 billion to £5.5 billion, costs which will largely be met by the British taxpayer through the oil industry's tax relief and special allowances.

Leakage from pipelines and petrol stations causes serious soil and freshwater pollution. In the United States, some 25 to 30 million barrels are spilt each year from leaking pipes. There are few estimates of pollution caused by petrol stations, but Shell UK admitted in 1983 that one third of its 1,100 petrol stations were contaminated to "a greater or lesser degree". In the US, one quarter of petrol station underground tanks are thought to be leaking.

The consumption of oil leads to global warming, acid rain and other air pollution. Petroleum by-products, such as pesticides and plastics have further ecological impacts of their own such as chronic poisoning and long-term toxic build-up in the environment.

under the Atlantic Frontier Environmental Network. Greenpeace reports that "It is hard to find a marine scientist or institution who has not got a contract with one or another part of the oil-funded work on the Atlantic Frontier."<sup>38</sup> The Royal Society for the Protection of Birds has been pressing BP to use a pipeline for its Foinaven field rather than a floating production, storage and offloading platform, because of the platform's higher risk of spillage, and has been demanding a strategic environmental impact assessment for all the oil operations in the region as a whole.<sup>39</sup> No formal legal EIA has ever been undertaken. Greenpeace has called on the UK government to halt development of the Atlantic Frontier oilfields.

Many onshore frontier regions, meanwhile, are the last remaining habitats of threatened indigenous and tribal peoples and are some of the world's most culturally diverse areas.

Until recently, BP thought that its two billion barrel Cusiana field in Colombia, discovered in the early 1990s, would guarantee group earnings well into the next century. The dream started to turn sour when reports emerged last year of environmental abuse and complicity with military human rights violations. A 5,000 man unit of the Colombian army, the XVI brigade, was set up in 1991 with oil company money. The military has murdered, raped and tortured "critics" of the company and colluded with death-squads. BP is accused of passing on information about anti-BP protesters to the military. "All unarmed opposition to the oil companies is labelled subversive and repressed by the

XVI Brigade," says British journalist Michael Gillard. A human rights Commission set up to investigate abuses reported that BP had paid \$1.5 million to the Colombian government through a war tax since 1992.<sup>40</sup> BP denied the allegations as "absurd" and "groundless", although it wrote to the Colombian government asking it to investigate whether any of its employees were collaborating with the army or paramilitary units.<sup>41</sup>

Many observers have noted that the reports emerging from South America have the ringing familiarity of Shell's activities in Nigeria. Member of the European Parliament Richard Hewitt, who visited Colombia with a European delegation in 1996, publicly compared BP operations with "Shell's inhuman exploitation of the Ogoni peoples in Nigeria".<sup>42</sup>

In Peru, Shell's Camisea operations threaten severe environmental and cultural consequences. At \$2.7 billion investment, the Camisea project is the single largest foreign investment ever in Peru.<sup>43</sup> The agreement, signed in May 1996 between Shell and the Peruvian government, "represented the greatest vote of confidence in the development of Peruvian hydrocarbon resources in more than a decade," according to *Petroleum Economist*.<sup>44</sup> Shell estimates that Camisea's reserves are 11 trillion cubic feet of natural gas and 600 million barrels of natural gas liquids.<sup>45</sup> The ten appraisal wells that Shell will drill are all located on indigenous peoples' territories, two of them in the reserves for Kugapakori and Nahua Indians. Shell's plans to drill on the reserve will force the Nahua and Kugapakori to

## Total Energy Providers

Comparatively low oil prices in recent years have forced the oil industry to reevaluate its business practices: "partnershiping" and "strategic alliances" have become common whereby companies spread their financial risks and costs by operating with other companies.

Much of this has taken place in "upstream" operations, particularly oil and gas exploration, but there are also fundamental changes afoot "downstream" as oil and electric power industries integrate their activities.

US companies have led this trend. Deregulation in the US has led to a spate of mergers between pipeline/distribution companies and electricity producers, generating "one-stop" energy providers. US multinational Enron has stated that it intends to become the "total energy provider". Last year, five mega-mergers were proposed in the US alone.

The pattern is set to be repeated elsewhere: the British government sees gas and electricity markets "inexorably converging".

Shell has announced substantial investments over the next five years to exploit its coal and gas reserves by becoming a global electricity business.

There has also been a spate of mergers between oil companies themselves, between oil companies and supermarkets, and between oil companies and fast food outlets. In February last year, BP and Mobil announced they would merge their European downstream operations in order to save an estimated \$500 million. The partnership, which has sales across Europe of over \$20 billion, will now rank next to Shell and Exxon with about 12 per cent of fuel sales, but will become the market leader in lubricants and oils, with 18 per cent of sales.

Also in 1996, Shell and Texaco announced that they would merge their operations in the US to produce the largest downstream operation in the country, with assets of over \$10 billion and an estimated 15 per cent of the market. The companies also disclosed that they were in discussion with Saudi Refining to combine Star Enterprise, a 50-50 per cent joint venture between Saudi Refining and Texaco, with Shell's East Coast operations. Both joint ventures are now expected to be operational at the end of 1998. Exxon has now admitted it is considering joint refining, too.

In November 1996 in the UK, three smaller companies, Gulf (a subsidiary of Chevron), Elf and Murco, announced

they would merge their refining and marketing interests. Earlier this year, the Japanese arm of Shell announced that it was looking at merging its refining operations with Mitsubishi Oil.

Other trends are becoming apparent too. "The energy services company of today is fast becoming the household services company of tomorrow," says Price Waterhouse's James Crump. Last year, BP and the Safeway supermarket chain announced that they planned to spend £100 million on developing a network of 100 jointly-owned food and fuel retail sites throughout the UK.

Meanwhile, BP opened its first Russian service station in a joint venture with McDonald's, which has a drive-in restaurant on the site. According to BP, the site "introduces the Moscow motorist to the concept of a combined refuelling facility and fast food franchise for the first time".

The companies are also employing other tactics to entice customers. Later this year, Shell plans to announce a SMART card loyalty scheme in the UK, linking it with a variety of retailers: electrical chain Currys, photographic stores Dixons, stationers John Menzies, opticians Vision Express and Victoria Wine.

# Climate Change

## Possibility? Hypothesis? or Established Fact?

Much as the oil industry might claim an optimistic future, its long-term viability is under threat from climate change. C.A.J. Herkströter, Chair of the Committee of Managing Directors of Shell, has described climate change as "potentially the most serious and intractable environmental issue facing society". Carbon dioxide from the burning of fossil fuels — oil, gas and coal — is the single largest contributor to human-induced climate change.

The oil industry has reacted to climate change with a dinosaur-like mentality. Oil companies have joined forces with car companies and other energy intensive sectors to fight any limitation of carbon dioxide emissions. "United we stand, divided we fall", says Exxon's Chair Lee R. Raymond. "We simply cannot afford to 'fall' on the critical long-term issues facing our industry, such as global climate change".

The American Petroleum Institute and the American Automobile Manufacturers Association are just two of the trade associations that make up the Global Climate Coalition, along with many oil and power generation companies. The Coalition describes itself as an "organization of business trade associations and private companies established in 1989 to coordinate business participation in the scientific and policy debate on global climate change". Together with the Climate Council and the newer, more moderate International Climate Change Partnership, these three corporate organizations form the core opposition to the findings of the Intergovernmental Panel on Climate Change (IPCC), the leading scientific authority on climate change.

Set up in 1988 by the UN General Assembly, IPCC's remit is to evaluate whether the earth is warming up as a result of human-made emissions of greenhouse gases or not. After seven years deliberation, the IPCC reported in 1995 that "the balance of evidence suggests that there is a discernable human influence on global climate". Says IPCC's Co-Chair Sir John Houghton:

"There is no doubt whatsoever that climate change is occurring due to man-made emissions of coal, oil and gas."

The oil companies have tried to prevent the world from hearing this. While the companies talk about global responsibility to their shareholders — in its updated general business principles, Herkströter announced that Shell companies have "as their core values honesty, integrity and respect for people" — they are spending millions of dollars attempting to scupper the IPCC and UN climate negotiations. Their tactics are simple: rubbish the science; water down the language in official documents; and scaremonger over the need for action.

"The science has been distorted in an effort to justify preconceived policies," argues William O'Keefe, Chair of the Global Climate Coalition and Vice-President of the American Petroleum Institute. "Global warming remains a possibility, not an established fact; realistically, global warming remains a hypothesis."

Increasingly, the oil industry has been arguing that any action to ameliorate climate change will slow economic growth and put millions of workers worldwide at risk. All the companies argue that industrialized nations cannot take unilateral action on climate change, and that developing nations must not have preferential treatment. To achieve this, there has been a concerted effort to shift the blame from industrialized nations to developing countries such as China and India.

This argument suffered a serious setback in February 1997 when 2,000 economists, including six Nobel Laureates, signed a statement arguing that the US should join other nations to take measures to slow climate change and that "preventable steps are justified".

One of the industry's main arguments is that it is better to wait and do nothing because in 20 years time, more advanced technology will be better suited to tackle the problem. Addressing his fellow oil executives last year, BP's Sir David Simon spoke of his confidence that "many of today's environmental concerns will, as so often in the past, be satisfied by new technology". This new technology needs growth — and growth needs oil.

The oil industry's response to climate change is indicative of its whole philosophy, namely to attack anything that could hinder its search for more oil and gas. The problem is to be over-

come with disinformation, glossy brochures, back-room lobbying and hard cash. This year, there will be an outpouring of corporate literature urging decision-makers not to tighten the international oversight of the industry, nor to implement binding carbon dioxide agreements.

Just as the industry uses 3-D seismic technology to look for oil, so it uses "3-D PR" — deny, delay and dominate — to continue its operations. For instance, a senior Shell executive, Heinz Rothermund, recently asked an audience:

"How far is it sensible to explore for and develop new hydrocarbon reserves given that the atmosphere may not be able to cope with the greenhouse gases that will emanate from the utilization of the hydrocarbon reserves discovered already?"

The official line of his company, published in May 1997, is deep denial: "There is no clear scientific evidence that man-induced climate change is actually happening now."

Other oil companies, however, have realised that diplomacy might be a better tactic than total denial. BP's chief executive John Browne set a conciliatory tone in a major speech on climate change in May this year:

"There is now an effective consensus among the world's leading scientists and serious and well-informed people outside the scientific community that there is a discernable human influence on the climate, and a link between the concentration of carbon dioxide and the increase in temperature . . . It would be unwise and potentially dangerous to ignore the mounting concern."

This is a big admission for an oil company — yet Browne continued:

"I disagree with some members of the environmental movement who say we have to abandon the use of oil and gas."

Despite climate change, nothing much has changed. If politicians and others do not begin to address ways of tackling the global domination of the energy sector by the oil industry, it could operate on a business-as-usual scenario for as long as possible — in all possibility for another 100 years.

## Occidental in U'wa Territory in Colombia

The entire 5,000-strong U'wa tribe in Colombia have vowed to commit mass suicide by leaping from a cliff unless Occidental de Colombia, a subsidiary of US company Occidental Petroleum, abandons its plans to drill for oil on their land in the eastern foothills of the Andes mountains.

The Llanos of Colombia — a region of plains stretching just North of the Amazon to Venezuela in the East — is rich in petroleum. Since the 1980s, Occidental has been producing 180,000 barrels of oil a day from its Llanos Caño Limon field, but production is now declining. The 400,000 acre Samoré Block, 30 per cent of which is within U'wa territory, lies conveniently close to a pipeline Occidental completed in 1985.

Occidental obtained a concession in 1992 from the state-owned Ecopetrol to explore and exploit the Samoré Block. The company has now spent some \$12 million on seismic testing and other exploration of the area from which it hopes to extract between one billion and 2.5 billion barrels of oil.

According to the contract between Ecopetrol and Occidental, each pays 50 per cent of extraction costs. For every dollar earned after extraction, however, Occidental gets just 15 cents, Ecopetrol taking the rest.

In 1995, after considerable debate as to whether the U'wa had been properly consulted according to their Constitutional rights, the Colombian Ministry of Environment granted Occidental the requisite environmental licence to proceed with exploratory drilling. The U'wa appealed on the grounds that oil operations would constitute an attack on their culture, survival and the ecological balance of the area. After various challenges, appeals and counter appeals, Colombia's highest legal authority, the State Council, granted permission in March this year for Occidental to proceed.

The U'wa — whose name means "intelligent people that know how to speak" — are one of the few indigenous peoples that have survived in Colombia with their ancestral culture intact and living, despite colonization having wrenched much of their once extensive lands from them.

Against such incursions, the U'wa are struggling to maintain not only their physical world, but also their sacred world, with its cosmology,

customs and particular conception of life. The intention behind their daily practices and rituals is care for the earth, the "live being" that Sira, the eternal father, and Rairia, the celestial mother, gave to them. Their belief that the earth is "a live being and is mother" determines their agricultural practices, how they hunt, fish and gather food, and how they carry out their rituals.

The U'wa have an oral tradition which binds and roots them to the ultimate limits of their territories, marked by ridges, lakes and rivers. They have a clear memory of ancient landmarks which today's legally-designated reserves do not begin to encompass.

"If we speak of territory, we must go back to the time before our lands were invaded by colonists. We have to understand the deep relationship that exists between our concept of what are our lands and between our cosmology and behaviour. When Yagshowa [the creator] was organizing the world, neither the Gringo, the American nor the Spaniard were yet here — just indigenous peoples, the *wejaya*. As soon as the creator Yagshowa had finished his work, then appeared the U'wa. The father eternal gave *ruiría* [petroleum] for all the world, but he laid down limits: he knew to where the Spaniards and others would come and for that reason he made this territory untouchable: they [Occidental] cannot touch here. Perhaps they'll be able to get authorization in another part, but not here."

According to U'wa laws of life, something sacred is inviolable. Some lakes, for instance, are sacred and thus untouchable; no indigenous person will ever go there. Yet such sacred places are considered to be "empty lands" by the State, while colonists regard them as forest covering land that needs to be cultivated. As the U'wa remark:

"the practice of the government, of the *riowa* [Whites] is extremely destructive and lacking any respect. We have not committed the insolence of violating their churches or temples, whereas they have sullied and wiped out our lakes."

They find it incomprehensible as to why the government and Occidental should not respect their laws of life:

"Why don't they respect our right to live and to be different from the *riowa* [Whites]? We want nothing other than to live in our world, and not to abandon the joy that always accompanies us in our own rhythm of life.

We do not want to live in the contaminated land of the Whites."

For the U'wa, petroleum contains blood that gives them and all living organisms, whether plants or animals, strength and life. Oil is "the mother of all the sacred lakes" and the U'wa believe it to be "working" and sacred in the same way that emeralds, gold and coal are "living and working" as active agents in the earth, which should therefore be left alone.

Occidental's exploitation of oil would not only destroy the U'wa's spiritual life; it would also have many immediate physical consequences. In their many public declarations of opposition to Occidental's exploration, the U'wa have stated that they have no wish to experience the widespread environmental destruction, violence and misery that has occurred in other "development" projects in Colombia such as opencast coal and gold mining, nor the problems associated with guerilla attacks of oil pipelines. During the first three months of 1997, 21 attempts were made to blow-up Occidental's existing pipelines — the yearly average in recent years has been 45. Five employees have been killed this year, 14 last year. Ten per cent of Occidental's costs for its Caño Limon field are for security.

The U'wa have gained considerable support in Colombia and elsewhere from environmentalists, journalists, some sections of the legal establishment, human rights organizations, and ecological and indigenous organizations. The future, however, is uncertain.

"For us it is forbidden to kill with knives, machetes or bullets. Our weapons are thought, the word, our power is wisdom. We prefer death before seeing our sacred ancestors profaned."

In early June, the U'wa decided to embark on a fast until mid-August in protest against the government's lack of progress regarding their plea to be left alone. During this time, they will not leave their territory, nor allow anyone from outside in.

WRITE TO: President, Occidental Petroleum, 10889 Wilshire Blvd, Los Angeles, CA 90024-4202, USA.

Mónica del Pilar Uribe Marin,  
translated by Peter Bunyard.

Mónica del Pilar Uribe Marin is a Colombian journalist; Peter Bunyard is a founding editor of *The Ecologist*.

compromise their traditional way of life, according to Rainforest Action Network, "robbing them of their basic human right to determine their own future".<sup>46</sup> If the Indians come into contact with diseases that are alien to them, it might mean total annihilation. When Shell conducted preliminary exploration of the rainforest in 1984, the company came into contact with the Nahua who had never had any communication until then with the outside world. They were exposed to whooping cough and influenza epidemics that killed off half the population. While some Nahua fled deep into the rainforest, others drifted to the local village and were left begging in the streets.<sup>47</sup>

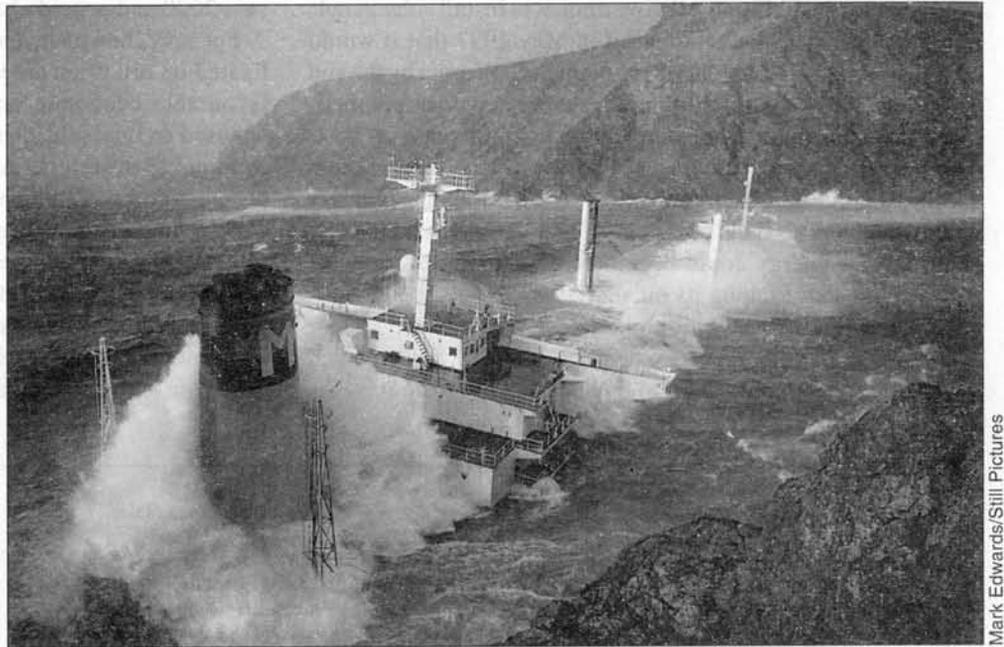
After its recent experience in Nigeria and fearful of another PR disaster, Shell now promises "openness, transparency and consultations" in its Peruvian operations.<sup>48</sup> The company has established a consultation process with a whole array of international and national "stakeholders". This could well divert criticism in the event of Shell's operations directly or indirectly harming either the Amazon or the Indians.

Shell also maintains that it will not build roads into the Amazon. According to Murray Jones, Shell Peru's Manager for health, safety and environment, "we are using helicopters and natural watercourses for transportation". If Shell finds gas, however, a pipeline will have to be built which will entail building a road and which will in turn open up the forest for loggers and other colonisers. "The Camisea development may have a whole series of repercussions," says Brendan Tobin, of the Peruvian Environmental Law Association, "including opening up the area to the coca trade, incursions onto indigenous lands, violence and colonization."<sup>49</sup>

Meanwhile, in Africa, Shell's operations in Nigeria still face scrutiny.<sup>50</sup> In December 1996, Shell admitted, after years of denials, that it had made payments to the military on two occasions. When people were killed, Shell denied that the soldiers it was paying were responsible. Those receiving payments from Shell included Colonel Okuntimo, a self-confessed multiple killer who tortured Ken Saro-Wiwa and had undue influence at his trial.<sup>51</sup> A recent report by the Nigerian group, Environmental Rights Action, concluded that:

"Shell has not improved on its environmental and human rights performance in the Niger Delta contrary to its claims in the media. Shell has been treating environmental and social problems in the Niger Delta as purely public relations matters."<sup>52</sup>

Shell also holds a 40 per cent share in a joint partnership with Elf (20 per cent) and Exxon (40 per cent) to develop the Doba oilfields of southern Chad, with Exxon as the operator. Approximately 300 wells will be drilled, with production



Mark Edwards/Still Pictures

*The Braer oil tanker ran aground off the Shetland Islands in 1993, spilling 85,000 tonnes of crude oil — just one of an unprecedented number of disasters over the past decade which tarnished the image of "Big Oil": the North Sea oil rig Piper Alpha caught fire in 1989; the Exxon Valdez ran aground off Alaska in 1989; the Sea Empress ran aground in Milford Haven in 1996, spilling 72,000 tonnes of oil; Ken Saro-Wiwa and eight other Ogoni were executed in 1995; and Shell proposed to dump the Brent Spar oil rig in the North Sea. In response, the oil companies launched an unparalleled public relations campaign. Shell, for instance, stung by criticism over its operations in Nigeria and its handling of Brent Spar, is spending millions on advertising and "greenwashing" so that consumers will continue buying its products. Both Shell and BP have started consultations with groups on sensitive oil and gas developments; critics have charged that these are attempts to offset further criticism of their operations.*

estimated at 225,000 barrels of oil per day. To export the oil, a 1,100 kilometre pipeline will have to be built through Cameroon to the coast. The project would be reliant on World Bank funding through the International Finance Corporation; the Bank is expected to make a decision on whether to go ahead with funding by the end of the year. If it does, oil is expected to start flowing in the year 2000.

According to the US group, the Environmental Defense Fund, the Chad/Cameroon project has "serious environmental and social risks that many people fear may create another Ogoniland". The Doba region, for instance, has long been an area of an ethnic and regional struggle. The underground pipeline will have to pass through "ecologically fragile rainforest areas, including an area that is the home of a Pygmy minority of traditional hunters and gatherers".<sup>53</sup>

## Kicking the Habit

Opposition to oil exploration in frontier areas is growing locally and internationally. But any halt to such exploration and extraction would be of little avail in the longer term if the companies simply moved elsewhere and carried on as before. The challenge is to halt oil consumption.

If it wanted to, the oil and gas industry could kick-start the renewable revolution. Indeed, many oil and gas companies are increasingly becoming energy companies (see Box, p.102); some oil majors have solar subsidiaries and there are signs of change. Shell, for instance, has recently reorganized its solar subsidiary. In March 1997, BP Solar signed a \$30 million

contract with the Philippines' government to install solar panels in remote villages, and announced in May 1997 that it would commission a solar manufacturing plant in California by the end of the year.<sup>54</sup> BP now admits that solar energy could be competitive within ten years. The company plans to increase its solar manufacturing capacity to reach \$1 billion in sales over the next decade. But this is still a fraction of the \$250 billion the industry will invest in fossil fuels next year. If that was invested in solar instead, solar energy could become competitive now and the world could start kicking its oil addiction.

Renewables — solar, wind and wave — currently account for less than one per cent of energy supplies. Shell has declared that renewable energy could grow to five per cent of supplies by the

year 2020 and provide half the world's energy by 2060.

For now, however, the oil industry is still that: an industry fixated on oil, often aided by governments offering extremely favourable economic and tax advantages. It is vehemently opposed to any subsidies for renewable technology, and will continue to search for and produce more oil and gas until it becomes completely uneconomical. Only then will it contemplate a fundamental investment in alternative fuels or energy sources — which will be too late.

Political forces will have to force change. There will also have to be a fundamental rethink for politicians and financial institutions and a far reaching realignment of an industry whose mentality is to carry on drilling, whatever the price.

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# Corporeal Flows

## The Immune System, Global Economies of Food and Implications for Health

by Richard A. Cone and Emily Martin

*Allergies and autoimmune disorders are increasing in incidence worldwide, especially among the urban poor. Analysis of the interrelated biological and social implications of such increases suggests that changes in food production, transport and consumption taking place throughout the world may be contributing to immune disorders, particularly through changes in "oral tolerance". Given the impact that changes in people's diets may be having on human health, understanding the interaction between the immune system and food has become extremely salient, even urgent.*

*"I awoke one morning with another stupefying, painful headache. I have been told it is probably caused by an allergy to something in the air. Faced with the impossible choice of taking medicine that will make me unable to stay awake, or trying to work in spite of the pain, I read the newspaper instead. I got absorbed in an article about a new form of treatment for autoimmune disorders in which patients are fed orally the part of their body their immune systems are reacting to. Patients experience remission or significant relief from their symptoms. I am electrified by the implications of this. Isn't my immune system reacting to particles in the air that are harmless like pollen or mould, treating them as harmful substances that should be attacked, producing swelling and pain in my sinuses? Maybe I can simply eat whatever is causing this reaction . . . Richard suggests I eat local, unfiltered honey straight from the hive. The bees have done all the work of gathering up pollen of every kind along with all sorts of airborne particles. Whatever I am allergic to, it might be in the honey; if it was, I would certainly be eating it. I immediately buy honey gathered from hives kept in a hamlet near where I live. After a few days of eating it, I experience profound relief from sinus pain. Ever since, as long as I eat honey from whichever place I am in, my sinus problems are dramatically reduced."*<sup>1</sup>

Emily Martin

The main types of disorders of the immune system are allergies and autoimmune diseases. They seem to affect women more than men.<sup>2</sup> Allergies, such as hay fever, asthma and to certain types of food, occur when the immune system "overreacts" to benign or mildly toxic airborne particles, such as pollen, or to components in food as if they were highly toxic. Immune

reactions expel these particles from the body with such vigour that "bystander" damage is caused to the lungs, gut or other exposed tissue; sometimes death by shock, dehydration or suffocation occurs.

Autoimmune diseases, meanwhile, occur when the immune system mistakenly attacks cells or tissues in the body that are otherwise healthy "self" rather than "non-self" or "foreign". In arthritis, for instance, the immune system attacks collagen or other tissues in the joints; in early-onset diabetes, it attacks insulin-producing cells in the pancreas; and in multiple sclerosis, it attacks nerve sheaths around cells.

The incidence of immune disorders is increasing worldwide. The US National Institute of Allergy and Infectious Diseases suggests that "allergies affect as many as 40 to 50 million people in the US" — one in five people.<sup>3</sup> The number of children diagnosed with allergic dermatitis in the US has increased from three per cent in the 1960s to ten per cent in the 1990s.<sup>4</sup> Data from Sweden, Switzerland, Germany, Denmark and Japan indicate a definite increase in allergic diseases.<sup>5</sup>

The most thoroughly documented rise in incidence is in asthma. Its prevalence in the United States rose by 30 per cent from 1980 to 1987.<sup>6</sup> From 1990 to 1992, the number of people in the country who said they had asthma increased from 10.4 million to 12.4 million.<sup>7</sup> Asthma is far more common in African-American children than in white children (26 per cent more prevalent).<sup>8</sup> From 1980 to 1987, asthma deaths in the US increased by 30 per cent.<sup>9</sup> They have also risen in Australia, Canada, Britain and New Zealand. As with the incidence of asthma itself, death rates are highest among minorities in the US: during 1982-92, African-Americans were three times as likely to die from asthma as whites.<sup>10</sup>

Implicated in the causes for the rise in immune disorders are environmental toxins, both airborne and in food. Japanese researchers investigating the dramatic increase in pollen allergies in Japan since the 1950s have shown that exposure to diesel exhaust exacerbates allergic responses to pollens.<sup>11</sup> French researchers found that severe food allergies in France from 1984-1992 were most commonly caused by foods that are "not of a primary nutritional importance: celery, crustaceans, fish, peanuts, mango, mustard" but are often "hidden allergens in commercial foods".<sup>12</sup>

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## Self, Non-Self and Oral Tolerance

The immune system consists of multiple arrays of continuously interacting cells, many of which move throughout the body. This "mobile brain" constantly monitors not only all the tissues of the body, but also all the particles that impinge upon the skin and the surfaces of the lungs, intestines and other mucosal surfaces. Immune system cells can distinguish "self" cells and tissues from "non-self" ones, such as pathogens, toxins, parasites, tissue grafts and other objects they recognize as "foreign". The immune cells are continuously learning and memorizing — and sometimes forgetting — what to attack and get rid of, what to leave alone, and what to protect.

The immune system is, however, much more sophisticated than the seductively profound "self/non-self" dichotomy implies. One might think, for instance, that the food we eat would be regarded by the immune system as "foreign" because it is "non-self", packed with foreign cells and foreign surfaces. But the immune system does not usually react against most of the food we eat. If it did, human beings would not survive. Immune reactions against food are illustrated by what happens when someone eats a small amount of food to which they are allergic: salivation, nausea, vomiting, diarrhoea, headache and sometimes death.

The immune system in the gut, which forms a major part of the mucosal immune system,<sup>13</sup> learns to recognize and accept ("tolerate") food, allowing it to be absorbed into the blood and lymph.

It also learns to recognize pathogens and toxins ingested along with food and helps prevent them from being absorbed, in part by secreting antibodies that trap the pathogens and toxins in mucus. Once trapped, this part of the immune system helps attack, eat and otherwise detoxify pathogens and toxins.

Similarly, in the lungs, the mucosal immune system learns to recognize innocuous particles of foreign materials, such as house dust, and to distinguish them from toxic pollutants that must be immediately expelled by coughing and increased mucus flow. This allows us to breathe with ease in the presence of multitudes of non-toxic foreign particles of dust (revealed in a beam of sunlight), while making us sneeze, choke or otherwise stop inhaling air when it contains too many toxic particles. By their speed and severity, allergic responses help us identify the allergen and to avoid further contacts with it.<sup>14</sup> Our "mobile" brain instructs our neural brain to alter our behaviour.

The mucosal immune system in the gut and lungs functions in partnership with the systemic immune system. The mucosal immune system not only learns to identify foreign substances in food as non-toxic and non-pathogenic, but also sends out cellular messengers to suppress systemic immune reactions against this food should it be encountered elsewhere in the body. This process is called "oral tolerance". Put plainly, if you eat a non-toxic substance, your mucosal system can inhibit your systemic immune system from reacting against that substance. The mucosal system, in the process of monitoring the digestion and absorption of food, learns what is non-toxic and "teaches" the systemic system to "tolerate" it, even though the substance is foreign and not self.

But if a food substance is combined with an "adjuvant" — a toxin, pathogen or components of a pathogen — both the mucosal and systemic immune systems react *against* the substance as if it were dangerous, abrogating oral tolerance to this substance.

## Diet and Oral Tolerance

Oral tolerance was discovered long ago. South American Indians are reported to have fed their children poison ivy leaves to prevent the allergic skin reactions that occur if the skin comes into contact with this plant.<sup>15</sup> An early immunology experiment demonstrating oral tolerance was reported in 1911.<sup>16</sup> Guinea pigs suffer a severe allergic response (sometimes fatal anaphylactic shock) if they are injected with chicken egg protein, but can safely eat such protein. When they are fed this protein for several weeks, they become tolerant to it; if they are then injected with the protein, they do not suffer a severe allergic response. Oral exposure can thus produce systemic immune tolerance. Eating what you are allergic to can help prevent the allergy.

The worldwide increase in autoimmune disorders has stimulated research into whether oral tolerance can alleviate autoimmune diseases, such as arthritis and early-onset diabetes. Several ongoing clinical trials seek to answer the simple question: if you have arthritis, can you alleviate joint pain and swelling by eating collagen itself to make your systemic immune system more "tolerant" of your own collagen? In one clinical trial, people with arthritis who ate collagen supplements

derived from chicken breast bones experienced significant reductions in joint swelling and pain; some of them had complete remission.<sup>17</sup> Similar trials are in progress in which patients with multiple sclerosis are eating nerve protein (myelin basic protein) from cow brain; while patients with uveitis, an autoimmune degeneration of eye tissue that can lead to blindness, are eating a protein (S-antigen) obtained from cow eyes. Trials are being planned for treating juvenile and early onset diabetes by eating insulin.<sup>18</sup>

Research also suggests that the broadest oral tolerance might be obtained by eating the entire tissue being attacked in an immune disorder, not just one of its molecular components; for instance, eating complete joint tissue, not just collagen, might be more protective against arthritis; eating whole pancreas, not just insulin, more protective against diabetes; and whole nerve or brain tissue, not just myelin basic protein, more protective against multiple sclerosis.<sup>19</sup>

Still further, animal tests attempting to stimulate oral tolerance so as to treat autoimmune diseases have demonstrated that molecules from many different species can stimulate protective oral tolerance. Because many molecular structures are similar, if not virtually identical, in a range of plants, yeast, bacteria and animals, a molecule or food component, regardless of the plant or animal species from which is obtained, may stimulate oral tolerance for similar molecules or components in the human body.<sup>20</sup>

There may be no need to eat large amounts of the relevant tissue; recent research suggests that such oral tolerance is best achieved by repeated feedings, even of small amounts, of the antigen. Indeed, small amounts might provide the best protection; chicken soup and other broths made from whole animal tissue contain diverse arrays of antigens that might produce broad-spectrum oral tolerance.

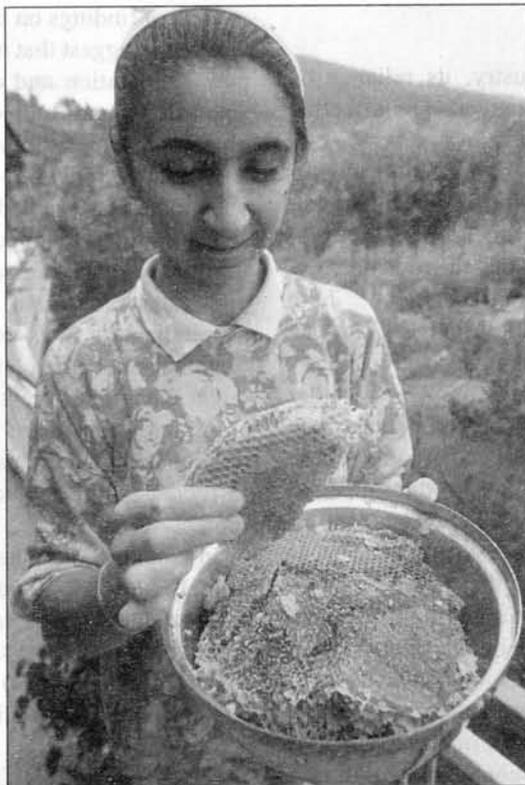
Thus eating a wide, diverse range of whole, rather than refined, purified or processed, plant and animal foods may broaden and enhance the efficacy of oral tolerance in suppressing autoimmune disorders.

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*"Understanding the interaction  
between the immune system and food  
has become extremely urgent."*

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For allergies, eating local plant and animal food may produce most effective oral tolerance against local airborne allergens from these same local plants and animals.<sup>21</sup> When people eat food produced in the place they live, the substances they ingest pass through and are intimately monitored by the mucosal immune system of the gut, giving it a chance to “learn” whether these substances are benign parts of the environment. Eating honey provides the mucosal immune system a way of learning which airborne particles are harmless. Bees gather up many of these particles (pollen and dust, for instance) and concentrate them in honey. When we eat honey and the particles come into contact with the mucosa of the mouth and the gut, the mucosal immune system learns to tolerate the particles and instructs the systemic immune system not to react against them as toxic. In urban environments with heavy burdens of airborne toxins, the immune system may also be more capable of distinguishing airborne toxins from benign airborne particulates. Experiments indicate that if mice are repeatedly fed extracts of ragweed pollen, they suppress allergic reactions against this allergen.<sup>22</sup> These experiments corroborate the traditional use of honey to prevent hay fever, sinus headaches and other human allergies.



*A family beehive in Yigitler Koyu City, Turkey.*

Another feature of food processing is disassembly:

“Chickens and turkeys were originally sold as whole birds, but since the early 1960s, more and more birds have been cut up, and some are further processed by the manufacturer. More than half of all poultry is now cut up by the manufacturer. Milk is now routinely disassembled into the butterfat and skim portions, and the latter is often further disassembled into a variety of products.”<sup>28</sup>

The removal of the skin, joints, inner organs, roots, peel and leaves from our food and its subsequent processing may well be increasing the incidence of allergies and autoimmune disorders, particularly among low-income people.<sup>29</sup>

Additionally, food has become less and less likely to be eaten near its place of production. One hundred years or so ago, most perishable food—dairy products, poultry, eggs, fruit, vegetables, meat and fish—in Europe and the United States was sold in local markets

and consumed near to where it was produced.<sup>30</sup> Today, most food industries are essentially “national in geographic scope: meat packing, most canned goods, dried and frozen fruits and vegetables, and beverages”.<sup>31</sup> Even for perishable foods or foods with high transportation costs—cottage cheese, milk, ice cream, bread, soft drinks and ice—some “80 per cent of the value of shipments was delivered within 200 miles of manufacturing points”.<sup>32</sup> Processing plants tend to be located close to sources of major raw materials; from there, the finished products are distributed around the country and, increasingly, the world.

Sysco, the giant food distributor that supplies the “away-from-home-eating-market” in North America, claims that “economics” have led it to import from abroad many crops and products that could be obtained in the US—seedless red bunch grapes from Chile, tomato paste from Hungary and apricots from Spain—because of lower costs. To take advantage of low wage rates elsewhere, California packing plants for quick frozen vegetables were “disassembled, put on barges, shipped down to the West Pacific Coast ports of Mexico and Central America, trucked into the interior and set up”.<sup>33</sup>

The proliferation of highly processed food in tandem with the globalization of the food industry means that much of the food we eat in the developed world has less and less of the local physical environment in which it was grown attached to it. Compare carrots bought from a local market with their roots and leaves intact, still dusty from the field, to washed, peeled, diced and frozen carrots processed by Bird’s Eye in a factory far away. When people eat food shipped across great distances, the substances that it does contain can be disjunct with local, airborne substances. Our immune systems learn about one set of substances through the food we eat and another quite different set through the air we breathe. The mucosal immune system is given little chance to learn which local pollen, mould and dust can be eaten without harm, and hence can also be breathed without harm.

## Globalized Processed Food

Trends in food production and distribution since the Second World War make it difficult for most people in developed countries to eat a diverse range of whole, locally-grown food in season. The most easily available food is highly processed and sourced from all over the globe.

Processed food products “account for nearly two-thirds of total world food and agricultural trade”.<sup>23</sup> As of the mid-1990s, an estimated 80 per cent of food consumed in developed countries is processed by the food industries.<sup>24</sup> Purchases of processed food make up as much as 70 per cent of household expenditure on food.<sup>25</sup> The amount of fresh fruit and vegetables in the US diet has been steadily decreasing.<sup>26</sup> Between 1960 and 1981, per capita consumption of fresh potatoes declined by half, while frozen potatoes increased nearly seven-fold. Per capita consumption of fresh vegetables stayed constant, while frozen vegetables nearly doubled. Consumption of fresh fruit declined, while consumption of canned fruit juices, frozen citrus juices and chilled citrus juice significantly increased.<sup>27</sup>

Increased processing has contributed to uniformity. The same food components (soya powder, dried milk, wheat flour, sugar, flavourings and carageenan) are combined and recombined in ever more sophisticated ways to create a diverse array of final products. The supermarket aisles appear to be filled with a cornucopia of different foods, but underneath the packaging and flavouring, they are made up of a markedly reduced set of purified and processed components.

## Pesticides and Preservatives

A third aspect of the global food industry, its reliance on chemical agriculture and preservatives, may also be affecting our immune systems.

Pesticides, fungicides and insecticides have become ubiquitous in contemporary industrial monocultures; many of these remain on the food after harvesting and processing. Preservatives are added at various stages to ensure that the food does not spoil during the time it takes to be transported over long distances and the time it sits on supermarket shelves. In urban environments, high levels of toxic substances such as heavy metals (lead), solvents (gasoline), cigarette smoke and other automobile and industrial exhaust products, can contaminate food. This array of pesticides, preservatives and urban airborne toxins consumed with food may contribute to allergies and autoimmune diseases through their role as "adjuvants".

Most of the time the immune system treats the food we eat as a "friend" and develops active tolerance that suppresses immune reactions against it, as well as suppressing immune reactions against all the components in the body that are similar to this food. If, however, a component of food is attached to a toxin — an adjuvant — the immune system treats the whole molecule as "dangerous" and develops active immune reactions against the toxin *and* against the food component. Eating a particular food to which an adjuvant is attached could abolish any oral tolerance previously obtained by eating the food alone, and could generate both mucosal and systemic immune reactions against the food and any corresponding tissues within the body — "oral intolerance".

Pesticides, preservatives and toxic pollutants all have the potential to act as adjuvants, yet few have been tested for their effects on immune functions. Although the mutational or "gene-altering" activities of chemical agents are now being screened by tests such as the "Ames" test, no comparable tests have been developed for screening the adjuvant-activity of chemicals to which people worldwide are now being exposed. The adjuvant potential of pesticides, preservatives and urban airborne toxins is reason enough to eat organic food in season, grown locally which requires minimal storage and transport.<sup>34</sup>

## More Research Needed

Until recently, far more research and attention has been devoted to the systemic immune system, which monitors the blood and lymph, than to the mucosal immune system which monitors the mucus on the surfaces of the gut, lungs, eyes and reproductive tracts. This results in a significant lack of understanding of allergic and autoimmune responses.

## Notes and References

1. Popular contemporary sources that extoll the healing properties of consuming honey abound in public libraries and health food stores. D.C. Jarvis, author of *Arthritis and Folk Medicine*, exclaims, "Honey taken every day is the body cell's best friend". Consumers' letters to the "Really Raw Honey Company" indicate the degree of passion felt by people who get relief from allergies in such a simple way. Word of mouth recipes and directions for using honey to alleviate the symptoms of allergy to airborne pollens are widespread; news groups on the Internet describe how people try using honey in various ways. The

healing properties of honey have been in fact been known for centuries. From the seventeenth century, honey has been described as a remedy for coughs, laboured breathing and sore throats. A report from Bulgaria claims to have found that more than half of over 17,000 patients treated with honey for chronic bronchitis, asthmatic bronchitis, bronchial asthma, chronic rhinitis, allergic rhinitis and sinusitis achieved complete remission of their symptoms. Today, honey is widely believed to have anti-bacterial effects, anti-tumour effects, and beneficial effects on the heart and the digestive system. See Nasi, A., *The*

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Recent findings on the effects of oral exposures on immune functions suggest that major changes in food production, transport, preparation and consumption worldwide in the last 50 years or so may be increasing the incidence and severity of immune disorders. Research into the connections between diet and immune function — "immuno-nutrition" — may suggest ways to reduce the incidence or severity of immune disorders by changing diet as well as changing the global food system.

More research is clearly needed. For instance, the extremely high rates of asthma in the south Bronx in New York — hospitalization rates are eight times the national average and "asthma is so common that the pockets of men on street corners bulge with small breathing pumps the way they might bulge with cigars elsewhere"<sup>35</sup> — are already being investigated in relation to both indoor and outdoor pollution, but not in relation to increases in the proportion of processed and transported food.<sup>36</sup>

In Nogales, Arizona, rates of autoimmune diseases are extremely high.<sup>37</sup> The rate of medically confirmed or probable cases of lupus alone (a disease, usually in young women, in which the immune system attacks the vascular and connective tissues in many organs) is the highest ever found.<sup>38</sup> Anna Acuna, a Nogales resident afflicted with lupus., said:

"To tell you the truth, it scares the hell out of me. It frightens me when I see young people diagnosed, it frightens me when I see mothers incapacitated. I think of us as being on the cutting edge of something that is happening all over the world".<sup>39</sup>

Scientists are now investigating whether these high rates are connected to Nogales' high level of toxic contamination (mostly from industrial run-off produced by US-owned *maquiladoras* on the Mexican side of the town) — but no one is looking at the additional role diet might play.

Scientific research into immuno-nutrition and the global food industry combined with consumer pressure could have an impact on food production and marketing. Extensive testing for the adjuvant activity of pesticides, preservatives and pollutants must be an early step in this process.

The outcome of such pressure, however, might simply be a technological fix: remedy the faults of highly-processed and transported food by further processing, for instance, or close monitoring of the use of certain pesticides and preservatives, or by adding a "globally representative" cocktail of airborne particles so people may can tolerate increasing levels of pollutants.

Until there is change for the better, we can at least test for ourselves whether eating whole foods, especially foods which contain a minimum amount of pesticides and preservatives, can alleviate autoimmune disorders by inducing oral tolerance.

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# Dying Wisdom

## The Decline and Revival of Traditional Water Harvesting Systems in India

by

Anil Agarwal and Sunita Narain

*Over the centuries, villagers in India have developed a wide array of techniques to collect rainwater, groundwater, stream water, river water and flood water. Since the colonial era, however, such village-based water harvesting systems have been declining, their viability undermined by increasingly centralized control over natural resources. Reviving these systems offers a realistic alternative to the large dams and water development projects being promoted by the authorities as a "solution" to India's water crisis.*

In 1979, a debilitating drought swept across India. As rains failed, agricultural production dropped, resulting in enormous human misery. The people of Sukhomajri, a village nestling in the denuded sub-Himalayan Shivalik hills, were not spared. They usually managed to grow one monsoon crop a year; that year, they did not even manage that.

In the desolate landscape, however, the villagers discovered a ray of hope. Soil conservationist P.R. Mishra had worked with them earlier in the year to build a small earthen dam across the path where the seasonal stream ran through Sukhomajri during the monsoon. Desperate to irrigate their crops, the villagers asked Mishra to help them make channels to convey the water, which had built up behind the dam, to their fields.

Mishra had long been trying to persuade villagers to stop grazing their goats in the region's degraded watershed. Before giving his assent to help them, Mishra stressed again that if the villagers did not stop grazing their animals in the watershed immediately, the small dam they had built would silt up quickly, and they would not have even that water when the next drought came. The villagers agreed to take care of the watershed.

Today, the village of Sukhomajri has several small water harvesting structures or tanks and regularly grows three crops a year. From being a food-importing village, it has become a food-exporting one. With grass productivity increasing and trees regenerating, the region now has so much fodder that the villagers have given up their goats in favour of higher-yielding buffaloes: they sell several hundred thousand rupees' worth of milk to neighbouring towns. As economist Gopal Kadekodi of the Institute of Economic Growth in New Delhi points out, "The rate of return from this project cannot be matched even by the corporate sector."

In Rajasthan, Tarun Bharat Sangh (TBS), a non-governmental organization working in the drought-prone district of Alwar, which straddles the Aravalli hill chain, relates a similar story. Rajendra Singh of TBS began encouraging the region's villagers to revive their traditional water harvesting systems called

*johads* — earthen dams thrown across the channels of seasonal streams. Unlike a usual dam, however, the rainwater is collected during the monsoon and allowed to percolate into the soil around it. Since the early 1980s, TBS has constructed nearly 1,200 *johads*, ensuring a guaranteed harvest in as many villages in the region.

During the drought of 1987 — probably the worst in India this century — there was an acute shortage of drinking water in Rajasthan, and government agencies were desperately trying to get water to far-flung rural communities by truck. Journalist Om Thanvi found that wherever households had kept intact their traditional water harvesting systems, known locally as *kundis*, the need for government water tankers was less, if not non-existent. After the drought, the government began to encourage villagers to construct their own structures.

Elsewhere, in the hill-top town of Aizawl, the capital of Mizoram in the north-east — a region known for its heavy downpours — local residents found that increased urbanization had led to the surrounding hillsides being denuded of tree cover and the drying up of mountain springs, creating an enormous water scarcity. The town, facing the unmanageable expenditure of running a fleet of trucks up and down steep hills to ferry water from the river in the valley below, decided to encourage rooftop water collection. Today, almost every house in Aizawl has developed its own independent water supply system.

### A Treasure Trove of Diverse Technologies

Although now largely in disrepair, there has been a tradition of water harvesting throughout India for centuries. Ancient texts, inscriptions, local traditions and archeological remains refer to a wide range of techniques — canals, huge tanks, embankments, wells and reservoirs — to harvest every possible form of water: rainwater, groundwater, stream water, river water and flood water. The country has a high total annual rainfall, but it is not spread evenly throughout the year, nor throughout the country. India has an extraordinary diversity of agro-ecological systems — hot and cold deserts, tropical and sub-temperate hill and mountain ranges, plateaus and plains — a diversity reflected in

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the variety of water harvesting systems that have evolved.

Thus wherever there were streams in India, especially in the hill and mountain regions, people used to construct simple engineering structures to divert the water into channels they had built which led to agricultural fields.

When streams turned into rivers, the engineering became more sophisticated and diversion systems larger. In the southern state of Tamil Nadu, for instance, a large stream is often diverted to feed a chain of 25-30 tanks in sequence. Such a chain of tanks — called “systems tanks” — is usually served by a stream which collects water over a large catchment area and thus tends to be considered more desirable than a tank with a single, small catchment area. Because of the wide variability in rainfall in both space and time, agricultural lands served by systems tanks have always been more expensive

and prized than land served by stand-alone tanks. The Palar Anicut system, for example, supplies water to 317 tanks, irrigating about 32,000 hectares in the North Arcot and Chengalpattu districts of Tamil Nadu. Some tanks are supplied directly by channels coming from the Palar river, others depend on the surplus flows from upstream tanks.

In arid and semi-arid regions, where streams are more seasonal, for instance, flowing during the monsoon season but not the rest of the year, the diversion channels first carried the water into a storage structure — called a *zing* in Ladakh, an *ahar* in south Bihar and a *kere* in Karnataka — so that the water could be kept for use in the dry period for human and animal consumption and for agriculture.

In the desert of Ladakh in the north of India, stream flow varies during the day. Dependent on glacier melt, the stream is almost non-existent in the morning after the cold nights, but heavy in the evening after the warmer day — a time when cultivators cannot use it. So Ladakhis divert the evening flows into a small reservoir which they could use the following morning. In certain villages of the eastern Himalayan states of Nagaland and Arunachal Pradesh, the villagers build the diverted channel through a cattleshed so that the water can pick up rich nutrients from cattle wastes before it reaches the fields.

Some storage structures were not river or stream fed, but simply collected water running off a catchment area to be stored for later use.

In the flood plains, people built embankments which were deliberately breached at certain times so that the floodwater would not only irrigate but also fertilize their fields and would control diseases like malaria — the fish in the floodwaters eat mosquito larvae.

In areas with a good groundwater aquifer, people harvested rainwater through dugwells and developed various technologies to lift the water so as to irrigate the fields. Different technologies were developed in places where groundwater was scarce. In the dry areas of Rajasthan, for instance, people have



*Many water tanks and their catchment areas had religious importance in the past. In South India, temples played a pivotal role in irrigation. Temple endowments were used to maintain tanks and irrigation channels and cultivate temple lands. In the early years after India's independence from Britain, however, large dams were promoted as the temples of modern India. Powerful pro-dam lobbies emerged because such dams were “politician-friendly, administration-friendly and contractor-friendly”.*

traditionally kept surface water and groundwater together. They have built wells and stepwells — wells with a flight of stairs leading down to the groundwater — with tanks and other types of water storage structures above them to collect rainwater. When the tank water dries up, people could use groundwater for their drinking water needs. In other places, surface run-off collected in the tank would not be used for drinking if clean groundwater was available from wells and stepwells. In the hills and mountains of the Eastern Ghats, people built subterranean structures — horizontal wells called *surangams* — to tap the water seeping down the hillsides for use as drinking water.

In several parts of India, notably in the west and centre, people built dams across seasonal channels to capture the run-off, not to use the water directly but to moisten the soil so that a post-monsoon crop could be planted in the rich soil of the tank bed itself. In the *haveli* system of Madhya Pradesh, the nature of the soils and traditional crops have forced farmers to store rainwater in the agricultural fields. The fields are embanked and farmers work out an arrangement among themselves to allow rainwater to flow from one field to the other. The collected water seeps into the soil, giving it enough moisture to yield a good crop in the following dry period.

Rajasthan has a long tradition of using rooftops to collect rainwater. In the town of Phalodi, if one household does not want to collect water from its rooftop, neighbours borrow the roof to collect water for themselves. In the Churu area of the Thar desert of Rajasthan, people have developed customized rainwater harvesting structures called *kundis* — wells which store run-off from a catchment area surrounding them, prepared so that rainwater runs rapidly into the well and gets stored. Such structures can be made anywhere if adequate land is available.

The nomadic Maldharis of Gujarat's inhospitable Kutch region have developed a system of procuring potable sweetwater in an area where rainwater is scarce and groundwater is saline. The density of sweetwater is less than that of saline water; hence harvested and stored sweet rainwater floats over denser saline

water. The Maldharis' system, locally called *virda*, is essentially a well in a tank.

To carry water over difficult terrain, such as the eastern Himalaya, and the north-eastern hill ranges, people built bamboo pipelines to carry water from springs to a convenient point where it can be used for drinking. In southern Meghalaya, near the border of Bangladesh, villagers use intricate networks of bamboo pipelines to deliver water to betel leaf plantations in rocky areas where it is impossible to dig or build channels. The entire system works like a modern drip irrigation network, delivering measured quantities of water straight to the roots of the plants.

## Management for the People, by the People

Water harvesting systems have to be continuously monitored, maintained and repaired. The scarce water also has to be shared among its consumers, particularly farmers. Across the country, people devised a variety of property rights systems to share water and to maintain their networks.

To ensure equity in distribution of water, villagers in Ladakh, for example, elect a water official, known as a *churpun*, at the start of each agricultural season. The *churpun* ensures that each farmer gets adequate water in proportion to the area of land he or she owns without leaving any field unirrigated. Disputes over the use of water are rare. Canals are repaired by community effort. The position of *churpun* rotates among all households to ensure that no one household monopolizes this critical post.

Villagers in Nagaland in north-east India have developed a variety of practices to share the available water for their terraced rice plots. Among the Angamis, Chakhesangs and Zeliang tribes, traditional water rights are held rigidly by individuals, clans or *khels* (villages). In Khonoma village of Kohima district, for instance, the person whose field is closest to the water source is responsible for conserving the source. The individual whose field is at the bottom of the canal is regarded as the owner of the canal; he or she has a major share of water and also regulates the flow of the water. He or she is also responsible for keeping the canal clean. While everyone has the right to take water from the stream, nobody can take more than their demarcated share.

In Kikrumba, a Chakhesang village in Nagaland, a curious combination of water rights operates. If a spring exists on a terrace which is not yet cultivated, the person who owns the land below the terrace is entitled to use water from the spring to develop their terrace. But if the owner of the uncultivated terrace later decides to develop the land, the two of them share the water equally. In general, the rights over run-off between different terraces are respected. The person at the top end of the terrace cannot harness what is legitimately the run-off of those below. Channels and catchment areas of ponds are maintained once every year, usually before the onset of the monsoon. The responsibility for organizing people to clean the channels rests with the last person tapping the channel, locally referred to as the *neipu*, literally, the lord.

Inhabitants of the central Himalayan villages of Uttar Pradesh have adopted a simple arrangement to ensure some measure of equity in water distribution, in particular, to avoid excess water being drawn by a channel at the head of a water system which would leave less water for downstream users. A small boulder is placed at the mouth of each turnout (the junction between the channel and the main stream). The size of the stone at successive

water turnouts is progressively smaller.

Water distribution in Ladyura village, is carried out by the ten members of an irrigation committee which includes a *chowkidar* or guard. Many non-elected members who are familiar with water distribution arrangements are co-opted as members. Major decisions are taken in a general body meeting open to all residents of the village. To resolve disputes, the irrigation committee members of the upstream and downstream villages sharing the same channel meet to discuss the matter.

In the state of Maharashtra, the community-managed *phad* irrigation system, prevalent in the Dhule and Nasik districts in the north-west of the state, probably came into existence 300 to 400 years ago. Villagers divide the cultivated land into *phads*, and every landowner has a piece of land in each *phad*. A series of *bandharas* or dams were built on the local rivers to divert water. The land fed by the water was divided into two categories: one with assured irrigation, another with unassured irrigation. In years of good rain, the unassured area, invariably at the tail-end of the system, also gets irrigation benefits.

Only one crop is grown in one *phad*; the decision as to which crops are to be grown in which *phad* is made by an assembly of irrigators, depending on water availability. Crops are rotated among the *phads* so that over a period of two to three years, every *phad* gets to grow sugarcane, the main cash crop and the most water intensive. In Daterti village, for instance, the total cultivated land is divided into four *phads*. In a year of plentiful water, the community may decide to grow sugarcane in three *phads* and millet in one. Conversely, in a year which has seen an average rainfall, the farmers may grow two *phads* of sugarcane and two of millet. In a bad year, the community may allow sugarcane in only one, grow millet in two and even keep one fallow.

## Pre-Colonial Roots

Although these varied systems of water harvesting are still in use in India today, the majority are culturally and technologically in ruins. Many of the dams and tanks have silted up because they have not been maintained. The British colonists were the first to destroy the traditions, followed by the independent state government.

When the British first came to India and set up the East India Company in 1600, thousands of water storage tanks were in use across the country. Some British observers were full of praise for the irrigation works they saw. Colonel Thomas Munro, the governor of Madras in 1820, noting the irrigation system in South India, said:

"To attempt the construction of new tanks is perhaps a more hopeless experiment than the repair of those which have been filled up [through siltation] for there is scarcely any place where a tank can be made to advantage that has not been applied to this purpose by the inhabitants."

Likewise, C.S. Crole, author of an 1879 book, *The Manual of Chengleput District*, wrote:

"Almost every catchment basin, however small, still bears traces of having been banded across and in many instances this was done in order to secure a crop of paddy on a few acres of stony ungenerous soil, to which all the fostering care of the British administration has failed to induce cultivation to return. Large and more expensive projects were not neglected. Even some of them bear witness to the

enlightenment of those Hindu kings, while the absence of scientific instruments in those remote times compels the astonishment of the beholder."

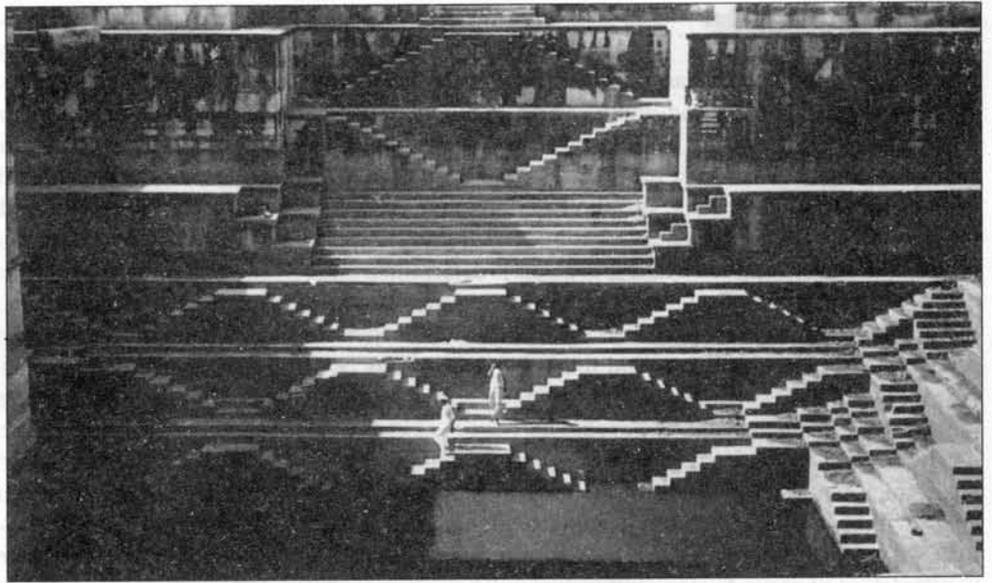
Yet British rule had the effect of laying these extensive irrigation works to waste. In their desire to administer and maximize their revenues from this rich land, the British steadily impoverished India's rural communities. Taxes on land were set so high that, even during drought years, the entire crop often had to be handed over to the authorities. Many people became landless and destitute. In the process, many of the resource management systems, including the water management structures that had emerged over the centuries, were broken down and weakened.

Until the arrival of the British, a sizeable percentage of the gross produce of each village was allocated to those who maintained irrigation and other water harvesting structures, often in the form of what the British termed "religious and charitable allowances". To increase their revenues, however, the British rescinded many of these allocations, reducing their beneficiaries to penury. Most of the remaining had their assignments greatly reduced so that they could no longer perform the educational, water management or other functions they were expected to undertake. With the destruction of the system for financing the maintenance of village irrigation and water harvesting works, the water systems slowly fell into disrepair. Community property became nobody's property, as the enormous expropriation of village resources by the state led to the disintegration of village society, its economy and its polity.

British irrigation expert Sir William Willcocks was invited by the British authorities in the 1920s to advise them on why India was experiencing repeated famines. Willcocks simply told them about the ingenuity of Bengal's flood irrigation system. His key lesson was that the British would do best to learn from the "natives". As British rule progressed, there was also a gradual shift in emphasis from minor irrigation works like tanks, wells, *bandharas* (dams) and small river channels to large dams and canals commanding extensive areas.

## Persistent Downslide

The British educated an entire class of Indians which no longer appreciated or understood India as it had been. When the country became independent from Britain in 1947, the leaders of the country turned their backs on the traditional village-based water harvesting systems and invested almost exclusively in mega-irrigation projects, greatly influenced by the technological dreams of socialist countries like the Soviet Union.



*A jhalara in Rajasthan collects the subterranean seepage of an upstream lake. Jhalaras were meant for community bathing and religious bathing. Often rectangular in design, they have steps down to them on three or four sides. India has a high annual rainfall in total but it is not spread evenly throughout the country. The country has an extraordinary diversity of agro-ecological systems, ranging from the dry hot desert of Rajasthan to the dry cold desert of trans-Himalayan Ladakh, from the sub-temperate Himalayan mountains to the high tropical mountains in the south. Interspersed are various hill and mountain ranges, plateaus and the alluvial Indo-Gangetic plains which are more flood-prone than any other part of the world. Some areas like the Thar desert in Rajasthan receive less than 200 millimetres annually, whereas several places in the north-east get as much as 11,400 millimetres each year. But there is almost no area where rainfall is less than 100 millimetres annually, sufficient to meet local needs if it is harvested properly where it falls. The rainfall is not spread evenly throughout the year either. As meteorologist P.R. Pisharoty points out, "Rainfall is largely concentrated during four months of the year. But then too, it does not occur daily. In most parts of the country, there is precipitation during not more than 50 days. On the days when rainfall does occur, it does not fall over a period of 24 hours. In fact, heavy showers are common. Most of the country receives rain for just about 100 hours each year."*

Other changes in several parts of India have further eroded the traditional water harvesting systems. Overall, community self-management has declined as bureaucratic intervention in village affairs has been steadily encouraged by India's political leaders. Technological changes, like the introduction of tubewells, mean that richer farmers who have the resources to install these tubewells and whose land is in the command area of an older water tank no longer have an interest in cooperating with the rest of the community in managing the tanks. The future of the *phad* system in Maharashtra, for instance, is now uncertain for two reasons. Firstly, the government has built reservoirs upstream to utilize the available river waters, thereby affecting the post-monsoon flows downstream where the *bandharas* feeding the *phads* with water were built. Secondly, a sugar factory has been built in the area, increasing the demand for sugarcane, a water-intensive crop.

Many central and southern Indian cities like Hyderabad in Andhra Pradesh, Chennai in Tamil Nadu and Bangalore in Karnataka grew up around traditional water harvesting systems. Now urban areas, these systems have either disappeared because of pressure from real estate lobbies or because of heavy pollution. As a result, traditional water harvesting systems continue to play an important role, mainly in remote areas such as many of the Himalayan states where the reach of water bureaucracies remains weak, rather than urban areas.

## Promising Potential

A revival of these locally-based and managed water harvesting systems is in the offing in India. Their potential is being recognized and discussed, not least because the large water supply systems built around mega-dams have been extremely capital-intensive, have long gestation periods and yield low returns in terms of increased crop productivity; this is largely because the water supplied by these systems is determined more by bureaucracies than by farmers. The growing movement in India against large dams — such as against the Sardar Sarovar scheme on the Narmada river and the Tehri dam — has been demanding that less socially and ecologically destructive systems of water management be developed.

The irrigation efficiency of farmer-controlled tubewells has been much better. But the rapid increase in tubewells in dry areas, without the supplemental groundwater recharge that used to be ensured by traditional water harvesting systems, is leading to a depletion of groundwater aquifers and will become a severe problem in many places in years to come.

Rainwater harvesting systems, on the other hand, require small sums of money, a large part of which could come from

local communities themselves, thus avoiding an undue drain on the state exchequer. They could be built within months (instead of years like large dams); they would be under the control of farmers; and they could be used conjunctively with tubewells as they can recharge the groundwater aquifers.

In terms of the water they can store, their potential is stupendous. If five per cent of India's land area — about five million hectares — was used to store water at an average depth of five metres, India would be able to collect 37.5-75 million hectare metres of water annually, depending on the rainwater collection efficiency which would probably range from 50 to 100 per cent.

Theoretically, there is no village in India which cannot meet its drinking and cooking water needs through local rainwater harvesting. If an average individual needs 2.5 litres per day of water for cooking and drinking, India's expected population at the turn of the century, one billion people, will need about 2.5 billion litres per day — 912.5 billion litres per year. If rain was harvested over a mere 83,000 hectares (830 square kilometres) every year — the territory of Delhi alone is 1,483 square kilometres — clean drinking and cooking water could be obtained for the country's entire population.

If the nationwide supply of water was stipulated at 100 litres

per person per day, the norm in many urban areas, one per cent of India's land area would need to be set aside for rainwater harvesting. If the rainwater collection efficiency was just 50 per cent, the total land requirement would not be more than two per cent of the country. Given the horrendous and growing pollution of India's rivers with industrial contaminants, and fertilizer and pesticide run-offs, Indians may soon have no other option but to capture raindrops as a clean water source. The technological option of cleaning the river water of its contaminants will probably be economically impossible.

Yet mere replication of the past may prove counterproductive. Water harvesting systems worked efficiently in different social, economic, demographic and political environments than those operating today. A Vaidyanathan, for instance, warns that rehabilitation of such systems will prove to be ineffective if it is not part of an integrated approach to land and water management. A decentralized system of water management demands a community-based system of natural resource management. Most laws that govern India's land, water and forests are the same today as those formulated by the British. The Indian government tries to deal with twenty-first century problems of environmental management with the nineteenth century legislation and bureaucracies of a colonial ruler. Will Indian governments continue to manage the environment through their gilded bureaucracies, or will they democratize its control and leave its management to rural communities?

For a copy of the 404-page report *Dying Wisdom: Rise, fall and potential of India's traditional water harvesting systems*, edited by Anil Agarwal and Sunita Narain, price Rs329/US\$18 (hb), Rs195/US\$12 (pb) [inc. p&p], contact Centre for Science and Environment, 41 Tughlakabad Institutional Area, New Delhi-110 062, INDIA. Fax: +91-11-698 5879/698 0870; E-mail <cse@saldt.ernet.in

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# Going Bananas

*The Washington Times* has described an ongoing agricultural trade dispute between the European Union and the United States as "one of the angriest and most complex trade wars on the international scene". The subject of the dispute? Bananas.

The bright yellow fruit is the world's most popular fruit, worth more than \$8 billion in world trade in 1995. It is the fifth most important agricultural commodity in terms of international trade after cereals, sugar, coffee and cocoa. For at least 15 Latin American and Caribbean producing countries, the Cavendish banana<sup>1</sup> is a crucial source of export income.

Apart from the 15 per cent of bananas and plantains produced annually which are traded on the world market, the crop is grown by millions of small-scale farmers in Africa, South Asia and northern Latin America for household consumption and/or local markets. Bananas are the fourth most important staple food worldwide, making a significant contribution to food security in dozens of countries in the tropics.

Most of this production is achieved with little or no external inputs. Once a producer grows for export to consumers in the industrialized world, however, considerable levels of "external" inputs (seed and agrochemicals) are required to compete in those markets effectively.

The European Union is the largest importer of bananas, consuming nearly 40 per cent of all traded bananas. Former Eastern Germans eat the most, consuming about 25 kilogrammes of the fruit per capita each year. Swedes come second with 16.5 kilogrammes. North Americans eat 13 kilogrammes per capita per year, twice as much as apples.

Europe grows less than 20 per cent of the bananas it consumes. Latin American countries supply 60 per cent of the European market, led by Ecuador (the world's largest exporter), Costa Rica, Colombia, Panama, Honduras, Nicaragua, Guatemala, and Venezuela. The rest of the fruits come from Africa, Caribbean and Pacific (ACP) countries, many of them former European colonies. The Windward Islands (St. Lucia, Grenada, St. Vincent and Dominica) and Jamaica are the main suppliers of the British market.



France gets its supply from its overseas territories (Martinique and Guadeloupe), and from Cameroon and Ivory Coast. Spain is supplied by the Canary Islands.

As the European Union took form in the 1950s and the 1960s, Britain, France and Spain sought preferential trade arrangements for many of their former colonies. In the case of bananas, these arrangements were enshrined in the Lomé Convention<sup>2</sup> and still persist today in various forms. Access for "dollar bananas" from Latin American countries to the EU has been restricted through quotas and tariffs. Germany, however, has no banana-growing ex-colonies and has supported cheap exports from Latin American countries. It had no tariff duty at all on bananas until July 1993 when a common European import regime for bananas was implemented.

## Banana Companies

The largest producer and marketer of bananas is the US company, Chiquita, formerly United Fruit (as well known for paying bribes in Central American countries and its links to a coup in Guatemala as for its fruit). Chiquita is owned by United Brands and sells about a third of the world's supply of bananas from which it obtains some 60 per cent of its profits. Chiquita's prepared foods division, mostly meats and packaged goods, accounts for about half of its sales but less than ten per cent of profits.

Close on Chiquita's heels is the US company Dole, owned by Castle & Cooke, a property and food group. Dole is the world's largest producer and marketer of fresh fruit and vegetables. Both Dole and Chiquita own vast banana plantations in

Central America; together they effectively act as price-setters.

The third largest banana transnational company is Del Monte, which was taken over in June 1996 by Grupo IAT, a company which owns Chile's third-largest fruit exporter. (Del Monte's canned food division eventually went to a consortium comprising Del Monte management, Japan's Kikkoman food company and Citicorp investors).

An Irish-based company, Fyffes, is the UK and Ireland's main banana distributor. Together with WIBDECO, a company set up by the Windward Islands' governments, Fyffes bought up British company Geest in 1995.

The multinationals are closely associated with exports from Latin America, especially Central America, where they are directly involved in the production of around 60 per cent of what they export. Plantations in Latin America may extend over 5,000 hectares and production costs are very low — a result of low wages, limited workers' rights and poor working conditions.

Since the early 1990s, transnational companies have tended to free themselves of direct ownership of banana plantations in favour of guaranteed supply contracts with medium- and large-scale producers (who own the land) in the countries where they operate. This trend, not confined just to the banana sector, allows Northern-based companies to shift the responsibility for labour and environmental conditions in the plantations on to local shoulders. They can state that these conditions are not within their control and that national legislation should ensure minimum standards are respected. Trade unions and other NGOs in Latin America regularly report, however, that wages, labour conditions and environmental management practices are generally speaking as bad, if not worse, on nationally-owned plantations as in their multinationally-owned neighbours. Adequate labour and environmental legislation often exists, but is rarely enforced until directly challenged in court.

## Trade Challenges

In 1994, the US announced that it would investigate the various EU tariffs and

quota restrictions on bananas from Latin American countries under Section 301 of its trade legislation. Governments have traditionally started trade wars to protect domestic jobs and key industries, but as an EU agriculture spokesperson complained, "the United States doesn't even export bananas". The banana fight involves multinationals' commercial interests and overseas markets far more than it does jobs at home — only 7,000 of Chiquita's 45,000 employees, for instance, are in the United States. US agricultural interests, however, are worried that caving in on bananas would send a signal to other countries that they too can protect their agricultural markets with impunity. In September 1994, 12 senators wrote to US Trade Representative Mickey Kantor warning of a dangerous precedent if the EU banana regime went unchallenged. The Windward Island Banana Growers Association, which represents growers in the Caribbean, predicted that any weakening of the European restrictions would leave them unable to compete.

On 8 May 1996, five American complainant countries launched a formal dispute settlement procedure against the European Union's banana import regime at the World Trade Organization (WTO) in Geneva. Led by the US itself, with Chiquita Brands International spearheading the complaint, the Guatemalan, Honduran and Mexican governments had persuaded Ecuador, the biggest single exporter to the EU, to join them on 1 February 1996. This alliance is targeting what the complainants argue is a discriminatory EU licensing system.

The complaints revolve around the charge that this system contravenes GATT and the new General Agreement on Trade in Services (GATS) signed in Marrakech in 1994. But the detailed, numerous and complex legal charges presented by the five against the EU are raising more fundamental questions about international trade rules and the rules of the game for resolving inevitable disputes.

In April 1997, the WTO's dispute panel ruled that the EU's tariff quota regime does negotiate and allocate quotas in a discriminatory way, violates the EU's commitments under GATS, and that the licensing procedures are at fault. The EU is expected to appeal the ruling on questions of law and interpretation. If the WTO verdict is maintained, however, which most observers deem likely, the European Union will need to modify its banana import regime. This regime at present favours small Caribbean producer countries, whose bananas are sold at a much higher price on the European market than the dollar bananas.

The Caribbean Banana Exporters Association, which represents growers in Belize, Jamaica, Surinam and the Windward Islands, expressed alarm at the WTO panel's report, saying it could have devastating consequences for their countries' economies. In Brussels, the EU emphasized that, if successful, the US strategy:

"would lead directly to the destruction of the Caribbean banana industry and provoke severe hardship and political instability in a region already struggling against deprivation".

### Banana Action

Parallel to the conflict at the international level, a new transnational non-governmental partnership of producer and consumer organizations has emerged over the last few years to address the major social and environmental issues involved

in the international banana trade and to hasten a transition towards a more sustainable banana economy. It brings together the interests of plantation workers, family farmers and European non-governmental organizations (NGOs) from over 25 countries in Latin America, the Caribbean, Asia, Africa and Europe.

The European Banana Action Network (EUROBAN) which groups together some 30 organizations in 13 countries, has been pressing for "fair trade", involving a higher producer price as well as respect for minimum labour and environmental standards. An International Fair Trade Banana Register has been established for producers who wish to apply. The Coordinadora de Sindicatos Bananeros de America Latina, a new regional structure that brings together independent banana plantation workers' unions in eight countries, is calling for all banana trade agreements to incorporate minimum labour and environmental conditions. At the same time, the Windward Islands Farmers' Association, which groups together family farmer organizations from five Caribbean islands, is promoting a transition towards a more diversified, less banana dependent economy, whilst actively supporting the demands for "fair trade" bananas in European markets.

Bananas have become a symbolic test-case for the future of international trade in agricultural commodities. The inter-governmental dispute and the emergence of a countervailing partnership have ensured that the stage is set for a rapid evolution in the complex inter-relationships between the different governmental, corporate and non-governmental actors involved in the banana trade. Whether this evolution leads towards greater economic, social and environmental sustainability remains to be seen.

*Sarah Sexton and Banana Link*

**Banana Link** is a non-profit-making cooperative campaigning on the banana trade and working towards fair trade in bananas in Britain. Banana Link, 38-49 Exchange St, Norwich, Norfolk NR2 1AX, UK. Tel: +44 (0)1603 765670; Fax: +44 (0)1603 761645; E-mail <blink@gn.apc.org>

### Notes and References

1. Nearly 90 per cent of internationally traded bananas are "Cavendish" variety
2. The Lomé Convention is a negotiated multilateral Treaty signed between the European Union and 70 ACP countries. The agreement's main benefit is duty free access of certain products from ACP countries into Europe and covers a range of commodities: coffee, bananas, cotton, cocoa, tea and wood products.



## The Women's Environmental Network (WEN)

Current campaigns include:

### Food Transport Campaign

highlighting the air pollution caused by current food systems & promoting locally-grown produce.

### Test Tube Harvest Campaign

on the labelling and health effects of genetically engineered food.

### No Patents on Life Campaign

### Waste Prevention Campaign

### Breast Cancer Campaign

a nationwide project researching the links between the incidence of breast cancer and environmental pollution.

To join WEN (£8 unwaged, £15 unwaged, £30 supporting), send a donation, or for further information (please send 31p A4 sae), contact WEN, 87 Worship St, London EC2A 2BE. Tel: 0171-247 3327.



## Population, Nature and the Politics of Reproduction

**SACRIFICED FOR HONOR: Italian Infant Abandonment and the Politics of Reproductive Control** by David I. Kertzer, Beacon Press, Boston, (Airlift Book Co, 8 The Arena, Mollison Av, Enfield, Middx EN3 7NJ, UK.) 1993, \$16/£14.99 (pb) 252pp. ISBN 0-8070-5606-7

**SOCIAL BODIES: Science, Reproduction and Italian Modernity** by David G. Horn, Princeton University Press, Princeton, (John Wiley, Bognor Regis, W. Sussex, UK) 1994, \$15.95/£11.95 (pb) 208pp. ISBN 0-691-03720-5

**THE STORK AND THE SYRINGE: A Political History of Reproductive Medicine** by Naomi Pfeffer, Polity Press, 1993, £12.95/\$22.95 (pb) 250pp. ISBN 0-745-611877

Each of these three exciting books examines the ways in which women's fertility (or lack thereof) has been managed by an array of interested parties, including the state, the church, communities, voluntary associations and a variety of medical personnel. Although only one is written by a historian, all three are political-historical in approach.

David Kertzer, a US anthropologist, begins his study of the Italian system of infant abandonment with its emergence in the thirteenth century, but he focuses on the nineteenth century when the number of abandoned babies reached its peak and when the system was finally dismantled. He concludes with an epi-

logue discussing some of the similarities between nineteenth century Italy and the twentieth century United States.

David Horn, also a US anthropologist, writes of the technologies of reproduction in Italy in the years following the First World War. He contrasts the fascist system of reproductive control with the liberal policies of the preceding era, highlighting in particular the ways in which reproduction became an object of the social sciences (statistics, sociology, social hygiene and social work) during the 1920s and 1930s.

British historian Naomi Pfeffer traces the social context of infertility in the UK from the 1870s to the 1980s. She examines the public discourses concerning involuntary childlessness and explores the other diverse social factors which influenced the types of medical research carried out and treatments offered for this condition. She also provides an excellent account of the development since the 1950s of the highly profitable pharmaceutical industry which develops and markets hormonal treatments and documents the changing relationship of infertility specialists with these companies.

Public responses to fluctuations in birth rates are critical to the stories both Pfeffer and Horn tell. Pfeffer explains how, after nearly 70 years of steady population increase, the birth rate in Britain began to fall in the 1870s and continued to do so until the 1930s. During this time, the average family size changed from over six children to under two.

At the turn of the century, two prevailing views explained this phenomenon. Some saw it as just one sign of the pervasive degeneration of a once great British civilization. According to this view, sterility was untreatable, an inevitable consequence of the Empire's demise. In contrast, the Fabian view was that the diminished birthrate of at least an important segment of the population was the result of conscious decisions and could be reversed by providing rational — that is, economic — incentives.

In the 1920s and 1930s, variations on these ideas were articulated by a number of pressure groups including the British Eugenics Society, neo-Malthusians and offshoots of the Fabian Society. What is striking about the British story, in contrast with the Italian case described by Horn, is the extent to which the government remained aloof from the debates

about the causes of and solutions to the declining birth rate. Pfeffer characterizes the strategies most frequently deployed by British politicians to avoid interfering in women's reproductive capacity as "abstinence", simply refusing to take a stand; "postponement" in the hope that pressure to do something would go away; and, the most common approach, "depoliticization", redefining the problem as a medical issue.

During the two world wars, the United States became concerned with overpopulation, believing that large, poor countries were breeding grounds for communism and, as such, a threat to world peace. According to Pfeffer, it was not until the mid-1950s that British journalists started to voice similar "anti-utopian anxieties" concerning the excessive population of non-industrialized countries. The low British birth rate which had so long been regarded as a problem was understood by some (including the Rockefeller Foundation) to be "an infertile, consensual utopia" to be replicated in non-industrialized nations.

It was not until the late 1960s, according to Pfeffer, that worries about overpopulation became linked with environmental concerns. In her view, fears about global population growth were "exacerbated" by the activities of the environmental movement. Unlike earlier periods when the government ignored apocalyptic warnings about levels of population, this time British politicians responded promptly by increasing restrictions on immigration and liberalizing access to birth control and abortion.

By the late 1970s, concerns about the effects of population on the environment were joined by others about the effects of the environment on fertility. In 1978, when the world's first test tube baby was born in the UK, infertility once again became an issue in Britain. It was assumed to be a new problem and was linked with fears about the effect of environmental pollutants on fertility, especially male fertility. Nevertheless, according to Pfeffer, "the current demographic anxiety" in the UK has less to do with rising infertility than with the problems of an ageing population.

What effect have these changing concerns about population growth, or its opposite, had on the actual experience of women in Britain? In some ways, very little. According to Pfeffer:

"when commentators, academics and politicians talk about fertility, they usually speak a language that fails to engage with people's everyday experience."

But even if they did not have a direct effect, Pfeffer shows how these debates "informed political policies and medical practice and . . . thereby structured women's experience of infertility" (and presumably of fertility as well).

Unlike the British case in which the government distanced itself from such concerns, in Italy, the government was a primary instigator in fertility and population matters. Benito Mussolini was central to the articulation of "the population problem" and the enactment of policies to deal with it. In his May 1927 Ascension Day address, he assessed the physical health of the population and laid out directives for the future. In Mussolini's view, the Italian population needed to grow to 60 million by 1950 if Italy was to enjoy the international success he desired. But whereas a declining birth rate in the UK appears to be an irrefutable fact, such a decline is less clear in the Italian case. Italy's birth rate was much higher than in many European countries, and several scholars maintain that whatever drops there were at this time were transitory.

Italy and Britain also differed in terms of placing the blame. In Britain, a primary concern had been the declining virility of British men; in the Italian version of the story, the culprit was industrial urbanization which was thought to have sterilizing effects on both men and women.

Italy also parted company with population programmes being formulated in Britain, Germany and the US at that time: it explicitly distanced itself from the negative eugenics pursued in these three countries, focusing instead on positive eugenics. The Italian focus was on quantity; to the extent that improving the quality of the national stock came into the picture, it did so through efforts to improve health through preventative measures rather than by reducing the fertility of "undesirables". For instance, Italian programmes focused on remedying the unhealthy effects of the city but never made "problematic the high fertility of the rural and working classes". Horn points out that: "rather than purification, the goal was multiplication; rather than selective breeding and sterilization, its means were improved hygiene, diet and education."

This remained the case "even after Italy passed racial legislation in 1938, affirming the 'Aryan' identity of Italians and restricting the rights of Jews".

Some of the Italian population policies

were directed at encouraging marriage, a prerequisite, ideally, for procreation. These included taxing bachelors; making marriage easier for military men by lowering the dowry requirements for officers and reducing the minimum age for marriage for soldiers; showing preference to married couples in employment and the assignment of public housing; and offering marriage bonuses and loans, as well as rail discounts for honeymoons.

Other policies addressed procreation directly, for instance, birth bonuses and tax breaks for large families (having seven or more dependent children, sometimes ten or more). There were also campaigns against contraception and abortion. Still other policies focused on trying to lower Italy's high rate of infant mortality through preventative medicine, by trying to limit rural to urban migration and by improving housing in the cities.

Much like Pfeffer, Horn concludes that although these demographic policies had few intended effects, they had several important enduring consequences. He maintains that:

"Scientific constructions of reproduction in the interwar period contributed to the stabilization (indeed 'naturalization') of a whole set of assumptions about bodies, populations and the spaces of technological intervention that continue to operate in contests about reproduction."

David Kertzer's book on the abandonment of infants is less explicitly about population. However, given the huge number of infants who were abandoned (an estimated 37,000 in 1866, accounting for as much as seven per cent of all births in some regions) and the extremely high mortality rate for those infants (with the number of those surviving their first year sometimes as low as 14 per cent and typically only 30-40 per cent), the founding home system can easily be construed as a state and church-sanctioned form of infanticide.

"Population" also enters the picture in terms of explanations given for the growth in infant abandonment in the early nineteenth century. According to Kertzer, some nineteenth century observers saw this increase in abandonment as a:

"natural, Malthusian response to population growth among the poor who lacked the resources necessary to support their growing number."

In the century following Italy's gradual unification, the population grew by two-

thirds. This increase was particularly dramatic during the first decades of the nineteenth century, the very years that infant abandonment swelled.

But upon closer examination, Kertzer found that there was no correlation between rate of abandonment and level of poverty. In fact, in some cases abandonment increased in regions where the standard of living improved. He suggests instead a complex explanation which takes into account not only changing economic and demographic circumstances, but also the role of patriarchal culture, the church and the state in regulating sexuality and society. Current debates about the relationship between poverty, population and the environment could be enriched by a similar approach. Indeed, all these three historical studies illuminate current efforts to reduce fertility rates among the poor.

Closely linked with fears about levels of population are cultural constructions of the "natural". Of the three studies, Horn deals most explicitly with this and even more importantly for his argument, cultural constructions of the "social." He maintains that before the "birth of the social" in the nineteenth century (a terrain under which "a wide variety of problems came to be grouped together"), procreation was understood to be a "fact of nature". Horn illustrates this change by considering the attitudes of Italian jurists towards the status of the family. In the early twentieth century:

"Catholics and liberals argued that the family was a natural institution and therefore substantially beyond the jurisdiction of the state, an 'island at whose shore the sea of law can only lap'."

But during the interwar years, Italian jurists came to believe that:

"the family could no longer be considered a natural institution, prior to society and outside the purview of the state. It was instead imagined as a social institution, open to (or perhaps even requiring) state intervention, and therefore transcending the domain of private law."

Other than these jurists, however, it is unclear in Horn's account who else held such an understanding. But regardless of whether and by whom families were understood to be a "natural institution", in Italy, as elsewhere, reproduction has always been socially regulated.

From rules regarding who should marry whom when, to taboos regulating behaviour during and after pregnancy, to if all went well, rites of passage for

incorporating the new member of society, procreation appears to be one area of social life over which societies typically attempt to exert particular control. Kertzer's book, *Sacrificed for Honor*, provides ample evidence of this for eighteenth and nineteenth century Italy.

If, as Horn suggests, twentieth century church leaders sought to define the family as falling outside the purview of state law, they did so in the context of an ongoing struggle between the church and the state to control this domain. According to Kertzer, the dramatic increase in the number of babies abandoned in Catholic Europe was a direct result of the fact that the Catholic Church, in response to the Protestant Reformation, "acted aggressively to bring reproduction and family life under its control". It agreed to define as legitimate only those children born to couples who had been married by a priest. (Prior to this, it had been adequate for a woman to have received a man's promise of marriage.) In order to ensure success for these new directives, the Church brought out the big guns of excommunication and denunciation from the pulpit for those cohabiting outside of marriage. Following Italian unification, the new secular government sought to wrest control of marriage from the church, and in 1866 created another increase in technically illegitimate children by requiring all marriages to be civil ceremonies. Henceforth, children born to parents who had only church- but not state-sanctioned marriages were counted as bastards.

Throughout *Social Bodies*, Horn endeavours to show that in the 1920s and 1930s a fundamental change in episteme took place which had profound implications for the way reproduction was understood and managed. He is only partially successful in making this argument, however. At times, Horn seems at times to follow the lead of the Italian sociologists and demographers he is studying in constructing his argument around the natural/social (no intervention/intervention) divide. But as Horn himself acknowledges (and as Kertzer's examples illustrate), a pre-social, completely natural reproductive past, while no doubt useful rhetorically, is not realistic.

At other times, Horn appears to be defining the changes in reproductive freedom and practice which occurred during this period in terms of a new type of intervention. Even then, the drawing of the kind of clear-cut "before and after" structural distinction that Horn seeks is

tricky. For example, according to Horn, by the interwar years:

"throughout the West, reproduction had ceased to be a 'fact of Nature' and had become instead a social-technical object, a potentially manageable social practice".

However, one could certainly consider the founding home system (complete with the ingenious wheel on which the baby passed anonymously through the wall in order to protect the identity of the mother), as a social-technical project designed to manage reproduction, at least the unsanctioned kind.

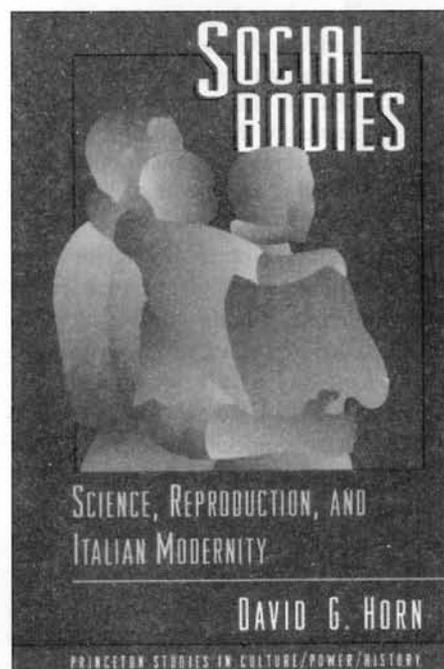
Horn also appears at times to structure his distinction around the extent of social control. Although he does not make a distinction between legitimate and illegitimate procreation, he seems to suggest that, before the 1920s, procreation which occurred within legally- and religiously-defined norms was left to follow a culturally taken-for-granted, or "natural", course, while in the interwar period, more and more aspects of reproduction (including those which had until then been considered "natural") became eligible for social control. "Gradually even natural increase would be denaturalized and constructed simultaneously as a social practice and social-technical object."

But as changing definitions of legal marriage and legitimacy show, this was not the first time that something once defined as "natural" and/or legal was redefined. And, of course, even reproduction which takes place in a sanctioned manner is socially regulated, just more subtly so.

Despite these difficulties, *Social Bodies* persuasively demonstrates how the florescence in the social sciences in the 1920s and 1930s provided a new ideology of control and set of disciplinary practices which sometimes reinforced and at other times superseded existing techniques for the social regulation of reproductive bodies.

The new reproductive technologies which Horn mentions in his conclusions provide a particularly clear indicator of some of the important changes that have occurred in the twentieth century regarding such regulation.

Medical intervention in and of itself is not new. For centuries, women have utilized home remedies and the expertise of midwives to assist them achieve, maintain or terminate pregnancies, and to help with birth and gynaecological problems. But Horn is supported by others in his assessment that the experience



of pregnancy and expectations regarding the efficacy of medical interventions have fundamentally changed in the last 100-150 years.

German scholar Barbara Duden, for example, uses an eighteenth century German medical text to construct a structural historical argument not unlike that made by Horn. She asserts that, in contrast with late twentieth century thought, conception in the eighteenth century could be "true and real", leading to the timely appearance of a child, or it could be "wasted, empty and useless — a *falsum germen* that nature must purge". She argues that as a result of new medical technologies, particularly imaging technologies such as ultrasound, the "uncertainty" that defined pregnancy in the eighteenth century has now been replaced with "expectations that can be managed at will".

My reading of a widely-used twentieth-century obstetrics text book suggests that this accident-prone view of pregnancy is still, in fact, an important part of contemporary US obstetrics. The difference is that advances in reproductive endocrinology and obstetrics, including new imaging technologies, now permit physicians to determine before birth whether a pregnancy is "true and real" or not. The timing is different, but ultimately these diagnostic technologies do not eliminate, or even really reduce, the reproductive uncertainties which concerned eighteenth century physicians and their patients.

But while obstetricians may still be keenly aware of the uncertainties of pregnancy, the lay public seem for the most part to think otherwise. Horn observes that:

"if today many Italians and others — in and outside the West — take it for granted that reproduction can be 'planned' or 'managed,' this is in some measure the result of a modern social-scientific construction of social bodies as objects of knowledge and government."

One gets little sense in either Horn's or Pfeffer's books what it was like to live as a reproducing or non-reproducing adult in the times and places they describe. I know from my own research on pregnancy loss in the US during the 1980s and 1990s that the expectation Horn describes — that pregnancies can be planned and managed — exacerbates the experience of loss by so ill preparing would-be parents for this eventuality.

Despite the importance of this new, popular understanding of pregnancy as an event which can be controlled, Nature, as Horn observes, "continues to have considerable rhetorical force". He suggests that "Nature has not . . . disappeared from scientific discourse surrounding 'infertility'", but has shifted from being understood as "part of the workings of physiology" to "part of parental desire". I would argue that Nature remains an important part of obstetrical understandings of physiology. Indeed, Nature provides a convenient, but dangerous, scapegoat in obstetrical understandings of reproductive problems.

But Horn is astute in noting the new ways that Nature features in "parental desire." This aspect of contemporary reproductive practice is particularly well illustrated in studies which explore assistive reproductive technologies for infertility, adoption, surrogacy, the birth of children with birth defects, and pregnancy loss. For example, Margarete Sandelowski describes how infertile couples (whether they employ reproductive technologies or choose adoption) negotiate their desire for a natural reproductive experience with the contingencies they face. She found that most couples undergoing fertility treatments constructed "technology as part of nature's design". She also describes how the new definitions of biological parenthood resulting from these assisted reproductive technologies are assisting adoptive parents to construct their parental ties as more natural.

Pfeffer, Horn and Kertzer all end their books with a look toward the future. Pfeffer is concerned about the continuing growth and increasing power of "a highly profitable procreation industry" and questions the wisdom of the World Health

Organization's recommendation that countries provide infertility services to all, regardless of "race, sexual preference, of social or economic or marital status", given the fact that, as the WHO itself acknowledges, many of these technologies "have not been adequately evaluated and . . . have considerable risks attached to them".

Kertzer ends with "a warning from history" that while it would be easy to dismiss the horror of the account of infant abandonment he has provided as some aberration from a distant past, "many of the basic cultural assumptions and ethical issues" like those informing the "debates over whether providing aid to unwed mothers and their children simply serves to reward vice and penalize virtue" are still with us today.

Horn concludes by suggesting that after 70 years of trying to know and control the social, the pendulum may be swinging back toward "nature", in the guise of biology, the social having proved to be less amenable to control than had been hoped. He sees the human genome as a key site for new, "still-emergent problematizations of bodies . . . [which] call forth their own governmental practices", including "a eugenics at the level of the individual".

In sum, these three marvellous books make substantial contributions to a rich and growing literature on reproductive knowledge and practice. The broad sweep and flow of each of these books, both in the periods they cover and the complexity of the social analysis they provide, makes them a delight. This breadth also accounts for the fact that these books are so successful in illuminating a number of important trends in contemporary Euro-American social life including current population anxieties and professional and lay understanding of "natural" procreative processes.

Linda L. Layne

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Sources: Duden, B., *The Woman Beneath the Skin: A Doctor's Patients in Eighteenth-Century Germany*, Harvard University Press, Cambridge, 1991; *Disembodying Women: Perspectives on Pregnancy and the Unborn*, Harvard University Press, Cambridge, 1993; Sandelowski, M., *With Child in Mind: Studies of the Personal Encounter with Infertility*, University of Pennsylvania Press, Philadelphia, 1993.

## Political Crisis, Political Solutions

**DIVIDED PLANET: The Ecology of Rich and Poor**, by Tom Athanasiou, Little Brown, New York, 1996, \$24.95 (hb) 385pp. ISBN 0-316-05635-9 (published in Britain as **SLOW RECKONING: The Ecology of a Divided Planet**, Secker & Warburg, London, 1997, £12.99 (pb) ISBN 0-436-20282-4)

*Divided Planet* is an invigorating antidote to the scores of waffle-filled books on international ecological issues with the words "sustainable development" in their titles. Tom Athanasiou avoids the apolitical platitudes of "common futures" and "common interests" and tells it straight: the global environmental crisis is a political crisis with political solutions.

While Athanasiou's main premise — that a "transition to an ecological society must involve a vast increase in justice and democracy" — is nothing new to progressive environmentalists, the eclectic and extensive examples and quotes he has gathered to construct his argument — and deconstruct the arguments of others — make *Divided Planet* a valuable addition to the literature. His breathless, in-your-face style, and his rapid-fire aphorisms and quips (the current Chinese economic system is "Market-Leninism"; Malthusianism is "the radicalism of those without hope") also make the book a surprisingly enjoyable read.

Athanasiou is at his best when deconstructing concepts and language. In a section critiquing the current state of the environmental movement, he warns against "absurd, apolitical solutions" based on partial explanations falsely perceived as essential causes. He cautions that:

"Names conceal as they reveal, not only 'industrialism' but 'gigantism', 'rationality', 'technology', 'greed', 'human nature', 'capitalism' and 'patriarchy' have all found favour as ultimate explanations, as charms against confusion. The green movement writhes with such abstractions, each with advocates eager to offer its partial truth."

"Sustainable development" is, says Athanasiou, just the "latest in a long line of comfortable incantations." As this

incantation loses its appeal, Athanasiou predicts, it will be replaced by "ecological security", which he argues is now "being auditioned to replace" sustainable development.

The shibboleths of economics are dissected with skill in *Divided Planet*. Even a word as routine as "price", explains Athanasiou, "is deeply marked, for it somehow manages to imply rational economic judgements, when in reality prices are irreducibly political, expressing as they do myriads of decisions about what will be made, and where, and how." Markets are not the neutral mechanisms neoliberal economists would like to believe, but rather are "rationing systems based not on age, citizenship, health, merit or geography, but simply on wealth". Neoliberalism itself is described as the belief that "the poor are best served, in the long term, by policies that, in the short term, benefit the rich."

Athanasiou sees current economic systems as "exterminist", a term he borrows from historian E.P. Thompson. Exterminism, wrote Thompson, with the nuclear arms race of the early 1980s in mind but with a wider relevance than he intended, described:

"those characteristics of a society — expressed, in differing degrees, within its economy, its polity and its ideology — which thrust it in a direction whose outcome must be the extermination of multitudes".

In a chapter called "Apocalyptic", Athanasiou critiques the positions of both free market hyperoptimists and the US radical environmentalists of the late 1980s such as "right-wing deep ecologist extraordinaire" Christopher Manes. Manes infamously wrote in *Earth First! Journal* that the death toll from AIDS was a "necessary solution" to ecological decline. Athanasiou sees this position as "heavy with the decaying products of impotence — frustration, anger, and paranoia" and believes that despair-born radical environmentalism of the Manes mould has had its day, chiefly because "Malthusian pessimism is so debilitating a hobble".

Despite his criticism of deep ecologists and eco-apocalyptic, Athanasiou admits that "with caveats and reservations," he is an apocalyptic himself. In 1990, the Worldwatch Institute warned that a "downward spiral of social disintegration" would result if the world did not make the transition to an "environmentally stable society" over the next 40

years. Athanasiou rightly points out that for a huge number of people (perhaps one-sixth of the world's population), this spiral has already arrived. While (with the help of some useful quotes from George Orwell) warning of the dangers of blindly extrapolating past trends into the future, Athanasiou does believe that "trouble lies on the horizon", and notes that, whether irreversible catastrophe lies 40, 50 or 100 years in the future, the time frame is essentially a technical point: "the difference between forty and a hundred years is, of course, no real difference at all."

In the final chapter of *Divided Planet*, "Realism", Athanasiou meets a problem all ecological authors encounter at the end of their books — having made a convincing case for the deepness of the hole we are now in and our seeming inability to do anything other than dig it deeper, he feels he needs to try and strike a note of hopefulness and explain that both the technological and social solutions exist to get us out. All that is missing is the political will and pressure. But after deconstructing so many theories of others, Athanasiou is unable to construct a credible theory of his own as to how we can emerge from our ecological hole. Athanasiou's "realism" about the possibility of a "global New Deal . . . which must compel the rich, the major consumers of the planet's resources, to profoundly reform their societies and make room for others [and] make 'sustainable development' into something more than a cruel slogan" is unconvincing. Such an Al Gore-type appeal does not stand up to the penetrating analysis to which he subjects other writers.

One feels, however, that Athanasiou

knows this himself, as his last chapter veers wildly between hope and despair. He bemoans that "there is no easy path to a green transition, and perhaps no path at all — for powerful minorities everywhere do not want change". Then he sees hope in the "alternative treaties" hammered out by thousands of activists from all over the world at the NGO Global Forum during the 1992 Rio de Janeiro "Earth Summit". Yet the exhaustive and exhausting debates which produced the "treaties" have produced no discernible changes in real world politics, while the alternative treaty concept was little more than an exercise to help the activists in Rio justify their presence at the largely useless jamboree.

The last words of *Divided Planet* appear to reveal Athanasiou's gut feeling on the chances of a global ecological and social New Deal:

"Our age seems . . . tragic in the classic sense, that despite all possibility, we seem trapped in just that remorseless 'working of things' that the Greeks saw as the core of tragedy."

Overall, while *Divided Planet* offers no new grand political theory of how we got into this mess, nor how we get out of it, the book is a useful reworking of the broad position of progressive environmentalists and an invaluable book for anyone new to the discourses of international environmental politics.

Patrick McCully

Patrick McCully is an Associate Editor of *The Ecologist*, Campaigns Director at International Rivers Network, California, and author of *Silenced Rivers*, Zed Books, London and New Jersey, 1997.

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## Pulp & Paper Power

**PULPING THE SOUTH: Industrial Tree Plantations and the World Paper Economy** by Ricardo Carrere & Larry Lohmann, Zed Books, London, 1996, £14.95/\$25 [Special price for *The Ecologist* readers: £12/\$20] (pb) 280pp. ISBN 1-85649-4381

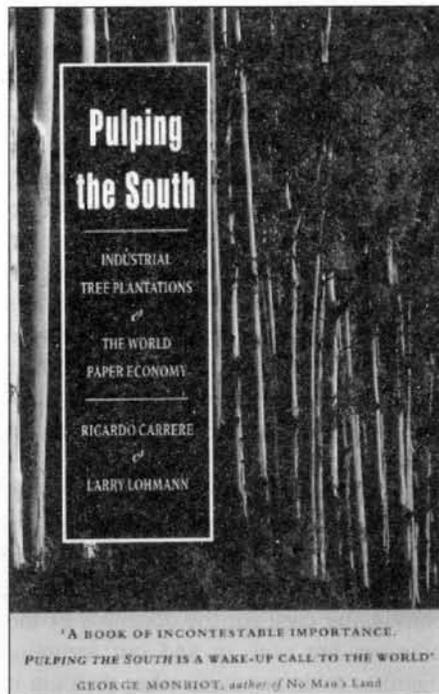
Despite (or perhaps because of) the rapid expansion of new media such as electronic mail and the internet, world paper consumption continues to increase. In 1910, our grandfathers and grandmothers used no more than 10 grammes per head per year; in 1994, world average per capita consumption was nearly 488 kilogrammes, a figure which shows no signs of dropping. The UN's Food and Agriculture Organization (FAO) predicts that, by the year 2010, paper consumption will have increased by 80 per cent. This ongoing swell is primarily the result of new "uses" such as disposable cartons, single item packaging and advertising materials.

Producing pulp and paper is environmentally costly: it involves the destruction of the world's forest resources, and causes air and water pollution. As land and trees are becoming scarcer in the North, where the growing consumption is concentrated, the industry is expanding the production of its raw material, timber, in the South.

Pulp plantations, however, often have disastrous consequences on local ecosystems and economies. Portrayed to the uninformed public as "nature" or "carbon sinks", they in fact destroy the native forest and other ecosystems they replace, are poor in biodiversity, wreck watersheds and exhaust the soil. Moreover, the plantations cut local people off from resources such as water and firewood, whereas local economic benefits are much smaller than promised.

These elements are the basis of Ricardo Carrere and Larry Lohmann's book on industrial forestry and the paper industry. *Pulping the South* examines the emergence of the new economic order in the world of pulp and paper. Its emphasis is on the increased use of tropical countries for the production of fast growing tree species, in particular, eucalyptus.

The book consists of three parts: a general analysis of the globalization of the world's pulp and paper industry; six



case studies from Brazil, Chile, Indonesia, South Africa, Thailand and Uruguay; and some guidelines for future political action.

The first part is a lucid analysis of the background to the world's paper companies' current interest in the South. One aspect is a change in technology. Paper manufacturers used to use a variety of materials, ranging from agricultural waste through silk and hemp to linen and cotton rags. Only in the late nineteenth century, when the demand for paper started to rise in the industrializing North as a result of the rapid increase in newspapers, did the industry turn to wood.

Wood, however, required new pulp mills to be built, mills which were less suited to processing other raw materials, thereby making the industry's step towards timber as its raw material almost irreversible. From then on, a growing demand for paper resulted automatically in a growing demand for trees.

Today, trees are no longer easily available to the industry in the North because of environmental policies or local market conditions. Therefore, pulp and paper companies are shifting their attention to the South where forest resources are plenty and cheap, and climatic conditions favourable to high wood increments. Moreover, Southern governments can often be easily convinced to go along with the conversion of the "unproductive" native vegetation into "highly productive" pulp plantations.

The industry's globalization is also the result of the price slumps followed by

rapid rises which characterize the pulp and paper market. In times of price rises, pulp and paper corporations opt for an aggressive expansion of their production capacity. They build new and larger mills and take over competing companies to reduce losses by conquering larger market shares. However, that expansion is possible only thanks to political backup through subsidies, taxation facilities, the creation of regionally integrated "free" markets such as NAFTA and the EU, and global liberalization (GATT). As a result, paper is produced at several different locations. The average wood fibre in a sheet of Japanese paper, for example, has travelled more than 6,000 kilometres from its point of origin and may come from different locations such as the US, Australia, South Africa and Indonesia.

Carrere and Lohmann also explore the network of bilateral and multilateral aid agencies, Northern consultancy companies and Southern elites, which facilitates the paper companies' expansion into the South. They discuss in addition the industry's dealing with local political resistance. Pulp and paper companies surmount professional opposition by co-opting "realist" foresters and intellectuals. They neutralize environmental and other political movements by counter-intelligence techniques taken straight from the FBI or MI5 laboratories.

These analyses of what drives the sector's expansion and the ways in which pulp and paper companies manage resistance, in combination with case material from six countries on three continents, underlie Carrere's and Lohmann's recommendation for a counter-strategy. Instead of accepting partial compromises that do not stop the advance of pulp plantations but only contribute to the fragmentation of opposition movements, environmentalists must unite around the central issue: the growing demand for paper. That demand grows only due to "innovations" such as single item packaging and the avalanche of advertising. A stop to these uses of paper will automatically put an end to the environmental and societal damage caused by an expanding industry.

The combination of an assiduous political economic analysis, inside information about the industry's political manipulative strategies, and strategy recommendations makes this study not only a worthy contribution to the current political ecology debate, but also a necessary reference for any activist trying to

resist the advance of pulp and paper power.

A weaker point of the book, however, is the way in which it deals with local people and grassroots movements. Intellectuals, forestry professionals and the larger NGOs fall into various categories of "opportunists", "realists", "idealists" or "radicals"; local grassroots movements, it seems, do not. Local movements in favour of pulp plantations are dismissed as "fake", artificial "astroturf" creations by the industry as part of their "managing resistance".

Such an approach implies closing one's eyes to the complexity of local interest and power struggles. It implies not taking seriously the hopes for economic betterment that some local people have in plantations. One example cited in the book is the attempt of the South African company, SAPPI, to establish a 30,000 hectare eucalyptus plantation just across the Natal border in Mozambique. A local movement preferred to swap abstract interest in biodiversity for immediate income through planting eucalyptus. SAPPI's support to that movement does not make its claims more "false" or less justified than those of movements in defence of the environmental interests that receive support from other foreign donors.

This minor flaw, however, is by and large compensated by the quality of the rest of *Pulping the South*. The richness of the data and the assiduous analysis of the political economy driving globalization make it not only a worthy use of paper but one of the best contributions to political ecology I know.

Roland Brouwer

Roland Brouwer is auxiliary professor at the Department of Forest Engineering of the Eduardo Mondlane University in Maputo, Mozambique.

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## Moral Rearmament

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**THE NEW IDEOLOGY OF IMPERIALISM**, by Frank Furedi, Pluto Press, London and Boulder, Colorado, 1994, £10.99/\$15.95 (pb) 140pp. ISBN 0-7453-0846-5

In this timely and thought-provoking book, Frank Furedi provides a powerful critique of Western notions of moral superiority and the closely linked percep-

tion that the Third World constitutes a major threat to the West.

Furedi examines British and US ideas about colonialism and nationalism in the period since the First world War. He draws on the work of French theorist Frantz Fanon, in particular on Fanon's study of French propaganda against the Algerian liberation movement. Fanon noted that the revolt against oppression was recast by the French as a fanatical threat to the innocent Western power.

Furedi revealingly dissects the range of colonial techniques that were used to delegitimize and "explain away" the nationalist movements that threatened imperialism. Thus, the colonized peoples were "immature", or manipulated by outside agitators, or putty in the hands of self-interested politicians, or led by half-castes who were working through the psychological insecurities arising from that half-caste status.

Nationalism, moreover, was often presented as a kind of "infection" that could be easily passed from one rebellious people to another, or as a precursor to Communism (the latter portrayal tending to reduce US pressure on Britain to decolonize).

In short, supporters of colonialism tended not so much to praise imperialism as to rubbish its opponents.

If decolonization was a blow to the self-image of imperialism, Furedi argues, there has subsequently been an attempt to achieve "the moral rearmament of the imperial mind". Here, the apparent failings of African nationalism in the post-colonial era have provided ample opportunities.

Furedi argues that this moral rearmament has a number of elements. First, the problems of the Third World are seen as stemming from its moral and cultural limitations. Second, the solution to these problems lies with the West. Finally, and most alarmingly, the Third World is being held responsible for many problems facing Western societies.

In these circumstances, "terrorists" become any foreign people you don't like. There are moral panics about a "clash of cultures" and about Islamic fanatics, perceptions and predictions that may become self-fulfilling. Even the elementary act of reproduction is seen as a threat — the threat of "overpopulation". What is more:

"Even relatively critically-minded people in Europe and America are apt to accept that tiny, technologically

insignificant countries like Libya are a greater threat to the world than the powerful Western capitalist nations."

Noting that famine and civil war have sometimes been portrayed as vindicating empire and that tribal hostilities are often wrongly assumed to be "ancient", Furedi goes on to criticize Live Aid and other global charity initiatives, seeing them as popularizing the view that the people of the Third World need to be looked after and protected, not least from themselves.

Such moral smugness, he suggests, underpins a dangerous lack of questioning about the right the West has to undertake foreign interventions — interventions that (as in the nineteenth century when imperialism was justified as an assault on the slave trade) are typically legitimized with some kind of humanitarian mission.



By the time of the 1991 war against Iraq, Furedi points out, there was virtually no intellectual critique of the West's right to intervene militarily in the Third World. Meanwhile, the role of the West in generating problems in the rest of the world is in danger of being forgotten. Furedi notes that the "war" on Third World drugs conveniently ignores the role of Western entrepreneurs and Western demand, whilst turning a blind eye to the CIA's role in internationalizing the drug trade through its covert activities in South-East Asia.

*The New Ideology of Imperialism* is eloquent and passionate. Noting the

dangers of self-righteous humanitarian interventions, Furedi states that:

"Western politicians seek to gain moral authority through highlighting their relationship with other morally 'inferior' societies. That is why failed politicians who are unable to solve the problems of inner-city London or downtown New York feel so much more comfortable handling the situation in Mogadishu with a few helicopters."

Two caveats. First, it is not altogether clear that what Furedi claims to be a "formidable consensus in the West supporting military intervention" — he cites Iraq and Somalia — is discernable in the wake of the West's scandalous neglect of Rwanda, which was itself a reaction to perceived US humiliation in Somalia.

Second, Furedi does not himself propose an answer to the exploitation and mass violence that has very often been perpetrated by Third World actors on their fellow citizens (albeit under socio-economic and political conditions profoundly shaped by colonialism in most instances). Such a "grand answer" is not Furedi's intention. But whilst pointing out that the ideology of Western interventions is shaped by the history of imperialism is a useful and illuminating exercise, it does not in itself remove the need for some kind of international intervention in some circumstances.

David Keen

David Keen is author of *The Benefits of Famine: A Political Economy of Famine and Relief in Southwestern Sudan 1983-1989*, Princeton University Press, 1994.

## McDonald's on Trial

**McLIBEL: Burger Culture on Trial**, by John Vidal, MacMillan, London, 1997, £15.99 (hb) 315pp. ISBN 0 333 69461 9

McDonald's turns up in the most unlikely places as I discovered when travelling by bus recently on the Isle of Wight, a small island off the south coast of England. A fellow passenger started to pour out his troubles, and one of his loudest complaints was that McDonald's presence at the local power boat races meant that hot dog vendors from the island didn't stand a chance of earning a living.

I felt a sense of recognition, therefore,

when I read about Helen Steel, one of two defendants in the McDonald's libel trial, who climbed to the top of Ben Lomond in Scotland to escape the stress of months in court to find at the summit a man wearing a T-shirt emblazoned with the slogan "McDonald's: 9 billion people served". Her response was instinctive. She handed him a leaflet.

It was the same leaflet, "What's Wrong With McDonald's", alleging links between McDonald's and the destruction of rainforests, food of low nutritional quality, the inhumane treatment of animals, food poisoning, low wages and other issues, that started the whole process in the first place.

Helen Steel and co-defendant David Morris were members of London Greenpeace, a small group of activists with no connection to international Greenpeace, when they were served libel writs by the multinational hamburger company, McDonald's, for handing out these leaflets.

According to John Vidal, the company at its US headquarters in Illinois was worried that the allegations in the leaflet would stick and become common parlance.

Steel and Morris were discouraged from defending the case. The odds against them were overwhelming. Financial help in the form of legal aid is not available to defendants in libel cases, while British libel law is notoriously difficult to understand.

Nevertheless, instead of bowing to pressure and apologizing to McDonald's, Steel and Morris, with unpaid advice from a sympathetic barrister but largely on their own, set out to prove to the satisfaction of the court that everything in the leaflet was true. The trial, which started in 1994 and lasted 313 days, became the longest in British legal history and is estimated to have cost McDonald's £10 million. The verdict is expected in June this year.

One of the most disturbing aspects of McLibel, as the case was quickly dubbed, is its implications for free speech. Journalists in England and Wales are regularly constrained in what they can write by the fear of libel suits which can result in damages big enough to destroy all but the largest newspapers. Clearly libel law may in some circumstances protect the vulnerable, but in practice it is rich and powerful organizations and individuals who sue. Vidal says that he was forced to censor himself in writing *McLibel* and

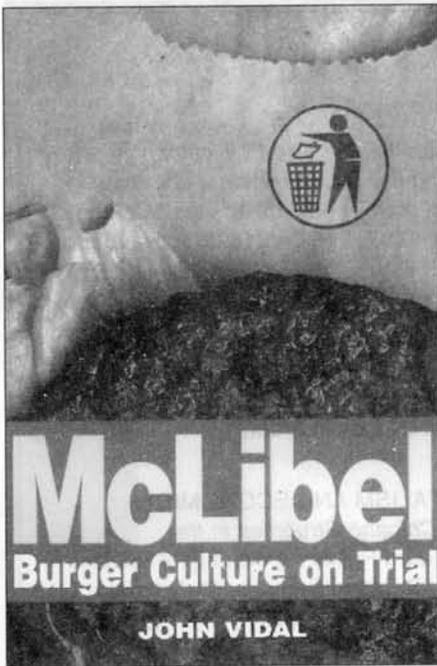
that journalists have been reluctant to cover the issues raised by the case for fear of being sued. Activists without the legal training or institutional backup that journalists have are even more at risk. The threat of long drawn out legal proceedings have become an instrument for corporations to silence and exhaust their critics in many parts of the world.

It is ironic that had the leaflet been couched in cautious, libel-proof terms, the wide ranging issues it raises would never have received the same exposure. Even as it was, the judge ruled that the case would not be heard by a jury since laypeople could not be expected to understand scientific material. The defendants argued that they too were laypeople, but to no avail.

Vidal draws attention to the sharp contrasts in courtroom style between the participants in the McLibel case. The prosecution's barrister (leading libel lawyer Richard Rampton) with his (usually requisite) establishment arrogance and McDonald's executives with their bland corporate PR struggled to keep the discussion in court as narrow and particular as possible. McDonald's could not be held responsible for the felling of trees in rainforests, for instance, since it owned only the land its restaurants are built on. McDonald's could not be held responsible if its customers insisted on adding to their intake of Big Macs with other takeaways and as a result consumed a diet too high in fat. McDonald's could not be held responsible if its customers dropped litter, and so on.

By contrast, Steel and Morris tried to demonstrate a much longer chain of cause and effect, emphasizing the spirit rather than the letter of the law. Vidal also makes unexpected connections. Some of these connections are unexpected: for instance, he compares Morris's background and pugnacity with that of Ray Kroc, the founder of McDonald's, who struggled against the odds to set up his chain of burger restaurants in the 1950s. He also interviews Steel and Morris about their childhoods and family influences. Although they are unforthcoming, it does emerge that both their families encouraged a questioning, dissenting attitude to the status quo.

But Vidal does not fall into the trap, as some journalists might, of seeing McLibel purely in terms of personalities. He puts the case in the context of a worldwide phenomenon: local resistance to the tide of economic globalism and to corpora-



tions which enjoy the sort of protection due to small private concerns but which are actually more powerful than governments.

Vidal also draws a comparison between the stance of Steel and Morris and the opposition to Shell by the Ogoni people in Nigeria. He quotes Vincent Magombe, the Ugandan co-ordinator of the African Literature Forum who, in defending the Ogoni culture, put his finger on what is perhaps the fundamental problem with global corporations, for the West as well as elsewhere in the world:

“These companies come and throw confusion in our heads. To start with, we think they are good. But they act culturally. They sit in place of our traditions, they change our language, our philosophies, the way we think. It’s the indifference that hurts.”

Barbara Norden

Barbara Norden is a lecturer in journalism at City University, London.

## Environmentalism's Origins

**GREEN IMPERIALISM: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600-1860**, by Richard Grove, Cambridge University Press, Cambridge and New York, 1996, £16. 95/\$19.95 (pb) 556pp. ISBN 0-521-565138

In the introduction to his 1864 epic, *Man and Nature*, George Perkins Marsh wrote that “systematic observation in relation to this subject has hardly yet begun, and the scattered data which have chanced to be recorded have never been collected.” The subject he was referring to was the impact of human beings on the natural environment, especially climatic change.

However, *Man and Nature*, as its copious footnotes indicate, was based on a great deal of scientific research that had already been conducted by that time. The same is true for the writings of several other ecological visionaries of the nineteenth century — John Croumbie Brown, Elise Reclus, Alexander Woeikof, and Franklin Benjamin Hough.

A century after the publication of *Man and Nature*, an important international conference on the theme of “Man’s Role in Changing the Face of the Earth”, was held in Princeton, New Jersey. Organized by, among others, Carl Sauer, Lewis Mumford and Paul Sears, it was a retrospective discussion of work that had taken place in the century since Marsh, Woeikof and their colleagues. One of the papers given at this conference by US geographer Clarence Glacken was an attempt to write the history of the scientific work which had formed the basis for the writings of the nineteenth century eco-evangelists.

Glacken followed up a decade later with an epic of his own, *Traces on the Rhodian Shore*, wherein he examined three key themes in Western attitudes towards Nature from antiquity to the eighteenth century: the idea of a designed earth; the idea of environmental influence; and the idea of human beings as modifiers of nature.

*Green Imperialism* can be described as a sequel to this great book. Its origins lay in, among other things, a visit Glacken made to Cambridge University in the early 1980s. There he met a young graduate student interested in his work and in a history of environmental ideas. Glacken suggested that he examine the life and work of Marsh’s contemporary, John Croumbie Brown. This is exactly what that student, Richard Grove, did, and the result is a book that will stand its own in time.

*Green Imperialism* has all the attributes of a grand epic. Its time frame is two and a half centuries, its region of focus — the earth itself. It is based on field and archival work in Australia, France, India, Mauritius, The Netherlands, the West Indies, South and Central Africa, Britain and the United States. Its chapters, written in a

pulsating and episodic narrative style, examine in great detail the role of botanists, doctors, physiocrats and others in different parts of the world in shaping a consciousness about the potential of human beings to affect the natural environment adversely.

They also are very informative about the role of islands in the emergence of a climatic environmentalism; about the significance of edenism and orientalism; and about the contributions of indigenous knowledge systems to European constructions of tropical nature. In doing so, they point to the existence of a scientific, or at least a systematic concern about the human impact on the natural world from at least the seventeenth century — a concern that, by the mid-nineteenth century, metamorphosed into a research project that has fuelled a great deal of contemporary environmental discourse. Moreover, they resuscitate a host of “proto-environmentalists” who might otherwise have been buried in the sands of history.

*Green Imperialism* has, however, had its detractors. It has been argued that Grove does not define what he means by “environmentalism” and that he imposes on his protagonists a category that they themselves did not use. Many historians have also accused this book of not being contextual enough.

Such criticisms, while valid, are unfair. They come from an attitude to historiography that discredits anything other than the specific and the narrow. There is a point and a purpose to Grove’s *longue durée* — to paint on a wide canvas, to tell a big story. In this, he clearly succeeds. *Green Imperialism* transports the reader into another world and another time, remote, but relevant to the present.

And after more than 500 pages, it makes the reader want to know more. For several environmental historians, it has already been a point of departure. In as much as it provokes other conventional scholars to start chipping away at the specifics, it would have achieved more than it ever set out to do. The details of such revisionist work might provide more nuance, but *Green Imperialism* will remain a pioneering work, a book that will take its own place in history alongside Glacken’s *Traces* and even that great epic of Marsh.

S. Ravi Rajan

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## BOOKS DIGEST

- **IMMIGRANTS OUT!** *The New Nativism and the Anti-Immigrant Impulse in the United States*, edited by Juan F. Perea, New York University Press, New York, 1997, \$19.95 (pb) 342pp. ISBN 0-8147-6642-0.

This book of essays examines the current surge in nativism — an intense opposition to immigrants and other “non-native” members of society — in the US in the light of past waves of anti-immigrant sentiment. The contributors highlight the changing relationship between “citizens” and “immigrants” and the effects of economics, history and demographics on that relationship.

- **SILENCED RIVERS:** *The Ecology and Politics of Large Dams*, by Patrick McCully, Zed Books, London (7 Cynthia St. London N1 9JF) and New Jersey (c/o Humanities Press, 165 First Ave., Atlantic Highlands, NJ 07716), 1996, £14.95/\$25 [Special price for *The Ecologist* readers: £12/\$20 inc. p&p.] (pb), 350pp. ISBN 1-85649-436-5

The best analysis yet of the political economy of dam building, this book brings together a wealth of new information to lay bare the networks of power that have led to dams being built at the expense of people and the environment — and to document the rising tide of resistance to the dam-building industry.

- **TRAVELS IN THE SKIN TRADE:** *Tourism and the Sex Industry*, by Jeremy Seabrook, Pluto Press, London, (LPC Group, Chicago. Tel: 1-800-243 0138) 1996, £9.99/\$14.95 (pb), 192pp. ISBN 0-7453 1116-4

Press coverage of the sex trade in Thailand routinely consists of ill-informed moralizing (against women sex workers rather than male tourists) and sensationalist denunciations of the “industry”. Through the words of sex workers and their clients, the author reconsiders these popular perceptions, explores the complex relationship between sex and tourism and raises questions concerning a variety of human and economic rights.

- **WOMEN, POPULATION AND THE GLOBAL CRISIS:** *A Political-Economic Analysis*, Asoka Bandarage, Zed Books, London (7 Cynthia St. London N1 9JF) and New Jersey (c/o Humanities Press, 165 First Ave., Atlantic Highlands, NJ 07716), 1997, £15.95/\$25.00 [Special price for *The Ecologist* readers: £13/\$20 inc. p&p.] (pb), 285pp. ISBN 1-85649-428-4

It is widely assumed among feminist, environmental and other movements that human numbers are at the root of the “global crisis”. Critiquing capitalism, industrialism, patriarchy and white supremacy, the author develops an alternative analysis, arguing that population control is another dimension in a hierarchical world order.

- **CHANGING THE RULES:** *The Politics of Liberalization and the Urban Informal Economy in Tanzania*, by Aili Mari Tripp, University of California Press, Berkeley, 1997, £13.95/\$18.00 (pb), 282pp. ISBN 0-520-20279-1

The author shows how the urban informal economy, which exploded in Africa in the 1980s in response to structural adjustment and market liberalization, is more than resistance to state control: it is a challenge to the existing political and economic order.

- **ENVIRONMENTALISM AND ECONOMIC JUSTICE:** *Two Chicano Struggles in the Southwest*, by Laura Pulido, University of Arizona Press, Tucson, AZ, (John Ramsey, 31 Oakdale Glen, Harrogate HG1 2JY) 1996, \$17.95 (pb), 282pp. ISBN 0-8165-1605-7.

The two struggles under investigation — the 1965-1971 pesticide campaign of the United Farm Workers union and a grazing conflict involving a Hispanic cooperative and mainstream environmentalists in northern New Mexico — combined with a theoretically novel critique of mainstream environmentalism point to new directions for understanding the intersections of race, class and culture in environmental politics.

- **IMPURE SCIENCE:** *Aids, Activism and the Politics of Knowledge*, by Steven Epstein, University of California Press, Berkeley, 1996, \$29.95/£25 (hb), 466pp. ISBN 0-520-20233-3.

In the short history of AIDS research and treatment, the boundaries between scientist or expert “insiders” and lay “outsiders” have been blurred to an unprecedented degree, contends Epstein. By combining an analysis of contemporary biomedical knowledge with a detailed and insightful discussion of AIDS politics, he shows how the AIDS movement has challenged scientific authority and transformed biomedical research practices. Yet Epstein points out that all social movements seeking to democratize expertise face unusual difficulties.

- **EQUALITY POSTPONED:** *Gender, Rights and Development*, by Helen O’Connell, WorldView Publishing, Oxford & One World Action (Bradley’s Close, White Lion St, London N1 9PF, UK), 1996, £10 (inc. p&p) (pb), 147pp. ISBN 1-872142-27-3.

A good introduction to human rights and gender issues in the context of international development, this book outlines how economic policies espoused by the IMF and World Bank and supported by donor governments are in direct contradiction of these bodies’ avowed support for women’s rights and gender equality. Examples from Bangladesh, Mozambique, Nicaragua, the Philippines and Zimbabwe illustrate that these economic policies not only depend on the existing unequal division of rights and responsibilities between women and men but also perpetuate and exacerbate it.

# Classified

## DIARY DATES

3-4 July 1997: **MEDIA, RISK AND THE ENVIRONMENT**, University of Wales, Cardiff. For further details, contact Louise Godley, Professional Development Centre, 51 Park Place, Cardiff, CF1 3AT. Tel: 01222 874136; Fax: 01222 874560.

6-8 July 1997: **INTERNATIONAL MICROSCOPY CONFERENCE & EXHIBITION**, Dept. of Physics, University of York. For details, contact Royal Microscopical Society, 37/38 St Clements, Oxford, OX4 1AJ. Tel: 01865 248769; Fax: 01865 791237; E-mail: <info@rms.org.uk>

9-15 July 1997: **EARTH FIRST SUMMER GATHERING**, Scotland. For those interested in, or involved with, direct action in defence of the earth. **It is NOT a Festival.** For general enquiries and offers of help, contact Earth First! Gathering, c/o 16 Sholebroke Avenue, Chapelton, Leeds, LS7 3HB. Tel/Fax: 0113 262 9365; E-Mail: conerstone@g.n.apc.org.

14-15 July 1997: **National Sixth-Form Conference for CAREERS IN LANDBASED INDUSTRIES**, Harper Adams Agricultural College. £15 including meals, accommodation and transfer from local railway station. All bookings by 4 July. For further information or to book a place contact: Richard Jopling, Harper Adams College, Newport, Shropshire, TF10 8NB. Tel: 01952 820280.

28 September-3 October 1997: World Futures Studies Federation Conference **GLOBAL CONVERSATIONS — WHAT YOU AND I CAN DO FOR FUTURE GENERATIONS**. Brisbane, AUSTRALIA. For more details, contact Sally Brown, Institute of Continuing and TESOL Education, University of Queensland, Brisbane, Queensland 4072, AUSTRALIA. Tel: +61 (7) 3365 6360; Fax +61 (7) 3365 7099; E-mail: <sally.brown@mailbox.uq.edu.au>

30 September-2 October 1997: **MAKING THE CONNECTIONS: International Land Regeneration Expo**, Speke Garston, Liverpool, UK. Focussing on the commercial benefits of land regeneration and urban renewal in the North West. For further information, contact Terry Harding, Tel: 01329 280653.

6-10 October 1997: **LANDSCAPE ECOLOGY: Things To Do**, Beurs van Berlage, Amsterdam, THE NETHERLANDS. Contact Ingrid Hoek, Secretariat WLO-25 Congress, Postbus 23, 6700 AA Wageningen, THE NETHERLANDS. Tel: +31 (317) 477986; Fax: +31 (317) 424988; E-Mail: <wlo@ibn.dlo.nl>

8 November 1997: **THE FOOD HEALTH CONNECTION: A Diet for Our Children's Future**, Warwick University Art Centre, Coventry. For more information, contact Good Gardeners' Association, Pinetum, Churcham, Glos, GL2 8AD. Tel: 01452 700306; Fax: 01452 750402.

12-15 November 1997: **ECOLOGICAL RESTORATION AND REGIONAL CONSERVATION STRATEGIES**, Ft. Lauderdale, Florida, USA. Contact Society for Ecological Restoration, 1207 Seminole Highway, Madison, WI 53711, USA. Tel: +1 (608) 2629547; Fax: +1 (608) 2658557; E-mail: <ser@vms2.macc.wisc.edu>

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