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Housing as Social Control in Tibet

Scott Leckie

During Chinese rule in Tibet, large areas of Lhasa and major towns have been cleared for redevelopment, and thousands of Tibetans evicted from their homes. The housing programmes have not brought improvements for the majority of Tibetans — but they have brought new forms of social control.

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 Tibet's subsistence rural economy is to be replaced with a market-oriented one under a new agricultural master plan, some components of which may be funded with international aid.
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China's market economy has increased insecurity and environmental degradation.

Ecolabelling schemes are being promoted by governments and industry as substitutes for environmental regulation. Without the backing of legally-binding standards, however, ecolabelling is little more than a marketing gimmick, providing minimal protection for the environment or for the consumer. Under GATT, even this weak instrument could be ruled a barrier to trade.

New and Resurgent Diseases: The Failure of Attempted Eradication 21 The Harvard Working Group on New and Resurgent Diseases

Barely 25 years ago, scientists predicted that modern medicine would eradicate infectious disease. Now old diseases are returning — and new ones emerging at unprecedented rates. A narrow focus on virus evolution offers an insufficient explanation, not least because it hides the role that human activities play in creating opportunities for disease.

Human exposure to chemicals which mimic oestrogens — the hormones that regulate many of the processes involved in sexual development and reproduction — has been linked to reduced fertility and cancers in women and men. Recent research suggests that soya products may also cause hormonal disruption. Action should be taken urgently to minimize human exposure to oestrogen mimics in the environment.

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Risk Society — Three Gorges — Life on the US-Mexican Border — The Gene Hunters
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Cover: Housing under construction in Lhasa, Tibet (© Norma Joseph FRGS LRPS/TIB). *The Ecologist* is printed on recycled paper, whitened with hydrogen peroxide.

Who Broke Mexico? The Killers and The Killing

In February, the Mexican government launched a military attack in Chiapas, a province on Mexico's southern border with Guatemala, in an attempt to crush the 13-month old peasant uprising by the Ejercito Zapatista de Liberaçion Naçional (EZLN) (See "Basta! Mexican Indians Say 'Enough!'", *The Ecologist*, May/June 1994). The eagerness of the Mexican elites and military high command to end the Zapatista insurgency is quite obvious, but it was pressure put on the Mexican president by large US investors in the country that was probably decisive in giving the go-ahead for the attack.

This is no speculative inference. The onslaught on the Zapatistas (now suspended) was announced by President Ernesto Zedillo on 9 February, less than a month after the US Chase Bank, which has billions of dollars invested in Mexico, issued a peremptory call for the extinction of Zapatista Subcomandante Marcos and his comrades. On January 13, Chase Bank had issued a "Political Update" announcing bluntly:

"While Chiapas, in our opinion, does not pose a fundamental threat to Mexican political stability, it is perceived to be so by many in the investment community. The government will need to eliminate the Zapatistas to demonstrate their effective control of the national territory and of security policy."

The memorandum, which was circulated by the bank's Emerging Markets Group to major investors, also stated that it is in the best interests of Mexico's ruling party to rig crucial state elections over the next few months. Throughout January, the Chase banker who wrote the memo was making the rounds in Washington, pressing the same message: Zedillo and the Mexican army had to move.

Zedillo had no options. The peso had collapsed and the Mexican state was substantively bankrupt; without bailout money from the North, it would have to default formally on its debt obligations. The bankers' demands and the attack on the Zapatistas went arm-in-arm. In fact, the downfall of the peso had nothing to do with land occupations in Chiapas, however much President Zedillo and Wall Street's bankers might try to link them. Why then did the peso plummet, and who made a killing?

The Bubbles Burst

The collapse of the Mexican peso in late 1994 and subsequent events provide a record, as detailed as tremors on a seismograph, of the stress points in US relations with "boom" economies in the Third World and the fantastic plunder such relations involve.

The implosion of the Mexican economy is intimately linked to that country's rise in recent years as one of the world's hottest "emerging markets," the name big institutional investors cite as an example to Third World and Eastern European countries that have deregulated their economies and allowed foreigners to buy domestic equities or debt, either directly or through mutual funds. Bankers and brokerage houses have made vast profits in these countries by injecting huge sums of money into small markets, thereby temporarily bidding up the value of existing assets. In every case, conditions demanded by overseas investors inevitably prompt larger scarcity, upsurge and repression. And, as has happened already in countries such as Turkey and Venezuela, the bubble inevitably bursts.

Mexico's transformation into the poster child of foreign investors was presided over in its most furious phase by Zedillo's predecessor, Carlos Salinas de Gortari. During Salinas's six-year reign, Mexico became Latin America's largest importer of Northern capital. Hundreds of stateowned firms were privatized, and some \$70 billion in foreign money poured into the country, mostly into stocks and bonds.

Under such external pressures, Mexican stocks behaved erratically even before the peso's crash. During the past year the Bolsa de Valores — the Mexican stock exchange — rose to an index of about 2,700 (after NAFTA was passed), fell to about 1,800 in May, then climbed sharply again before dropping to the current level of about 1,970. After its privatization in 1991, Telmex, the Mexican telephone monopoly, traded at \$27.25 per share, climbed to \$75 in early 1994, but then in early February of this year, was trading at \$34 a share.

The Northern investors in Mexico have been led by players such as Goldman Sachs; Salomon Brothers, which since the late 1980s has handled \$15 billion worth of transactions in Mexico; and Citibank, a leader in the US corporate campaign to pass the NAFTA agreement. With the help of the Mexican government, matters were arranged to insure maximum security for their money and hence their peace of mind.

First, Mexican government bonds, or tesobonos, carried yields of up to 16 per cent, a rate reflective of the high risk involved. Mexican stocks also offered handsome rewards, as seen in the spectacular early rise in the value of Telmex shares. The whole arrangement was sweetened by the Mexican government's pegging the peso to a most favourable rate of about 3.5 to the dollar — a rate that bore no relation to the real state of the Mexican currency but which allowed investors to protect their profits when transferring their winnings back home.

A mere fraction of Northern capital — somewhere between 5 and 15 per cent — went to direct investment in Mexican plants and equipment. Sackfulls found their way into the pockets of the Mexican elite (including Harvardtrained Salinas, who, in the tradition of his presidential predecessors, has retired to a life of luxury). Last year *Forbes* magazine listed 24 Mexican billionaires, more than the combined total in Britain, France and Italy. At last count, the financial collapse had reduced their number to 10.

Doing the Banks' Bidding

It should be clearly understood that the performance required of the Mexican economy during the Salinas years had absolutely nothing to do with economic growth in any rational understanding of the word. What Salinas and his cronies did not steal, and what remained after the profit remittances of foreign investors, was used to finance a trade deficit that reached \$25 billion last year. The need to attract foreign money gave US investors great leverage with Mexican authorities — all the more so because major banks, frightened by the temporary losses brought on by the 1980s debt crisis, have slashed direct lending to Mexico.

The central demand of US fund managers has been that Mexico keep the peso artificially inflated. The peso should have been devalued long ago, but Mexico did not want to advertize its underlying economic ills before NAFTA was passed. Nor was the Clinton Administration anxious to see the peso devalued, as it would have cast doubt on its claim that a NAFTA-generated export boom, which was contingent on Mexico's maintaining the value of the peso, would create hundreds of thousands of new US jobs.

The seismograph began to quiver urgently in February 1994, when the US Federal Reserve began reversing its policy of maintaining low US interest rates, which had pushed investors abroad. By the time Zedillo replaced Salinas as president in December 1994, Mexican reserves had fallen to less than \$7 billion, forcing Zedillo to devalue the peso in the hope that such a move — by effectively slashing Mexico's import capacity — would stem the haemorrhage of hard currency at the national treasury. The Mexican currency promptly collapsed, by 40 per cent.

Searching for culprits, the US press placed the blame for the crash on the Zapatistas and their calls for social reform. Also coming in for recrimination was the Mexican peasantry, charged with having embarked on a "consumption boom" instead of engaging in austere toil. Most ridiculous of all, the US press relayed the charge from the financial sector that the entire catastrophe could have been avoided if the Mexican government had not resisted the wise counsel offered by its First World tutors. *The New York Times* journalist Keith Bradsher wrote on 2 January that Mexico had "failed to respond quickly when the economic world around it began to change," and had adopted an economic "strategy that flew in the face of advice from officials of the International Monetary Fund".

In fact, during the past five years, no nation has been more rigorously servile than Mexico in implementing recommendations from the IMF and the World Bank, both of whom hailed the country as a model when its economy was riding high. Back in March 1992, the *Financial Times* said that Mexico was:

"the darling of the [World Bank's] economists (and its major shareholder, the US). The bank does not need to force Mexico to do anything; the two sides agree on almost everything... World Bank economists and Mexican officials often spend weekends together brainstorming on policy issues."

Handouts, Please

As soon as financial disaster struck, the US bankers, who had been pushing reverence for free markets in Mexico and the Third World, were on the telephone to Washington demanding a US government bailout. When Congress refused to rubber-stamp Clinton's original rescue package, their hysteria boiled over.

"The prestige of the president, the chairman [of the US Federal Reserve Bank] and the leadership of both houses in Congress has been committed," cried Robert Hormats, vice chair of Goldman Sachs International. If Congress killed aid to Mexico, "the feeling in the rest of the world would be that we are a nation in disarray, a country incapable of addressing a crisis. The psychological blow would be enormous." A report in Merrill Lynch's *Emerging Markets Biweekly* said that the "key near-term policy challenge is to stabilize the peso's value to limit additional injury to balance sheets," and that a bailout was essential "to restoring confidence to Mexican financial markets, and to avoiding contagion effects to other emerging markets."

The man the financiers called most urgently was one of their own: ex-Goldman Sachs co-chair Robert Rubin, now US Treasury Secretary. Rubin was holidaying in the British Virgin Islands when the crash came, and "his initial instinct," said *The New York Times*, "was to let the Mexicans and the market sort it out, and to return to the important business of casting for bonefish in the azure waters of the Caribbean." But, unsurprisingly, Rubin soon "became convinced that in Mexico, the [US] Administration was faced with the most modern of foreign policy crises. No nukes, no troops, just the potential for global financial apocalypse."

The Treasury Secretary's familiarity with the Mexican scene is rather more detailed than a word so vaguely grandiose as "apocalypse" would suggest. Rubin's 1993 financial disclosure statement lists 42 firms with which he had "significant contact" while at Goldman Sachs, of which six were Mexican firms or state agencies, including Mexico's finance ministry and one of its leading banks. Many of the others were US companies with substantial business in Mexico. Goldman Sachs itself has, of course, made enormous profits of its Mexican operations.

The bonefish were soon left in peace, as Rubin rallied to the cause of bailout, which should be seen not so much as a "rescue" in any sense of restoring the Mexican economy to health, but as a way of keeping Mexico "in play". A \$47.5 billion package was organized by the US government, the immediate consequence of which was to allow resumption of the speculative merry-go-round, with investment banks swiftly resuming their lucrative practice of underwriting and trading Mexican securities.



Saving Wall Street

Some \$70 billion in Mexican government notes will mature this year. Even though Mexico has raised short-term interest rates on one-year bonds to 24 per cent, in a desperate bid to prevent a mass withdrawal of foreign capital, most investors will cash out instead of rolling over their notes.

It will be almost impossible for the government to sustain payments to bondholders demanding their money. By January 31, Mexico's reserves had fallen to \$3.5 billion, of which \$2.1 billion came from a credit line extended by the US Federal Reserve and other foreign central banks a few days after the peso collapsed. In short, Mexico has no capital. The country is effectively bankrupt.

"I can guarantee that the emerging markets departments on Wall Street are now calculating how far Mexico can last [with the \$47.5 billion bailout]," one banking veteran tells us. "They'll be advising their firms to buy notes which mature in May or June, and then they'll get out. Beyond that point no one's going to want to hold on to Mexican notes for more than a few weeks."

While Wall Street plots its strategy, most Mexicans confront a new round of austerity. Inflation for 1995 is expected to at least double, to a rate of more than 20 per cent. The weaker peso also means, *ipso facto*, a huge increase in the country's foreign debt, which is denominated in dollars, now worth some 40 per cent more against the Mexican currency than in December. At \$166 billion, this external debt is already far higher than in 1982, when Mexico's bankruptcy set off the Latin debt crisis. Zedillo, in a move seen as "encouraging" by foreign investors, intends to hold wage increases for the year to 7 per cent.

Frank Cass

ENVIRONMENTAL POLITICS

Editors **Stephen C Young,** University of Manchester, UK and **Michael Waller**, Keele University, UK

Environmental Politics is concerned with three particular aspects of the study of environmental politics, with a focus on industrialised countries. First, it examines the evolution of environmental movements and parties. Second, it provides an analysis of the making and implementation of public policy in the area of the environment at international, national and local levels. Third, it carries comment on ideas from both a 'deep' and a 'shallow' perspective, generated by the various environmental movements and organisations, and by individual theorists.

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On the political front, investors want to insure that domestic discontent does not threaten Mexican stability, which brings us back to why Wall Street wants Subcomandante Marcos and his comrades in the EZLN dead.

Bullets, not Ballot Boxes

Heading up the Wall Street war party is Chase, whose January 13 memorandum warned that Zedillo might not be able to gain the confidence of the Zapatistas and their supporters because "the monetary crisis limits the resources available to the government for social and economic reforms". This is bank-speak for saying foreign investors should have first rights to the dwindling reserves at the Mexican treasury, leaving nothing for the anti-poverty programmes Zedillo promised to Chiapas.

The author of the memo is Riordan Rett, director of Latin American Studies at Johns Hopkins School of Advanced International Studies, who was fired as a Chase adviser after the memo was leaked. Regarded in the past by his academic peers as conservative but rational, Roett hardened after going to work full-time for Wall Street, following in the grand homicidal tradition of such academics-turnedpolicymakers as Walt Rostow, Henry Kissinger and Herman Cohen.

In addition to calling for the Zapatistas' elimination, the Chase Bank's memo also explained:

"The Zedillo administration will need to consider carefully whether or not to allow opposition victories if fairly won at the ballot box. To deny legitimate electoral victories by the opposition will be a serious setback in the President's electoral strategy. But a failure to retain PRI controls runs the risk of splitting the government party".

Both the US financial elites and security establishment view anything less than a PRI dictatorship in Mexico with profound alarm. A Latin American Strategy Development Workshop at the Pentagon in 1990 considered that "a 'democracy opening' in Mexico could test the special relationship [between the US and Mexico] by bringing into office a government more interested in challenging the US on economic and nationalist grounds." Delal Baer, a senior fellow at the Center for Strategic and International Studies, lamented the dilemma faced by Mexico, which is being pressured to pen up its political system even though "financial markets might not respond positively to increased democracy because it leads to increased uncertainty."

While the bankers were banging the war drums, military advisers from Chile and Argentina — two of the most brutal of Latin America's armies, responsible for tens of thousands of deaths during the "dirty wars" of the 1970s — were already in Chiapas training Mexican troops. In another ominous move, the Chilean army has discreetly named Colonel Oscar Carter Cuadra as military attache in Mexico. Carter is the son-in-law of General Manuel Contreras Sepulveda, the former director of Pinochet's secret police, and currently appealing his prison sentence for the 1976 murder in Washington of Orlando Letelier.

It has also been reported in Mexico that the CIA helped with the identification of Subcomandante Marcos, and it is beyond question that the US Southern Command was cognisant of the military moves planned for Chiapas.

The Corporate State

The crash in Mexico has rocked other emerging markets. Stocks, plunged not only across Latin America but in Hong Kong, Indonesia, Poland and Thailand.

Despite efforts here to portray Mexico's crisis as *sui generis*, these emerging market bubbles share many common features. They all have inflated currencies, corrupt elites who have a tendency to loot foreign capital, and widely overvalued stocks as a consequence of the enormous inflow of speculative money from abroad. The net result is economies poised for collapse.

In the period of the high Cold War, a worried banker would ventilate his fears to the Treasury Department or the national Security Council. Corporate concerns would normally be answered with the dispatch of troops or the activation of the CIA.

In the Mexico crisis, the state still serves as the guarantor of last resort, but the ordering personnel are drawn from the corporate world. When Mexican presidential candidate Luis Donaldo Solosio was assassinated last March, Fidelity's fund manager, Robert Citrone, felt it was imperative that Mexico reassure foreign investors by propping up the peso.

Citrone did not waste time contacting the State Department. Instead, he rang up authorities at Mexico's Central Bank to offer his advice. Days later, with the peso falling, Fidelity and other US investment firms cut back their purchases of short-term Mexican treasury certificates, ravaging stock prices and pushing up interest rates. Mexican authorities soon took steps to bolster the peso.

When it comes to the play of major financial institutions in world politics, the state, in a way unintended by Marx, may be withering after all, at least in the observation of the proprieties of a former time, whereby a US Treasury official might pretend to speak in the "national interest," even though he was reading from a policy statement dictated by an oil company or an arms firm. But Robert Rubin is a bond trader from Wall Street wherever he sits, a fact that he does not disguise. Corporate power is so brazenly overwhelming that the mediation of the state is scarcely required to invoke the national interest, and the important decisions are openly taken by the chieftains of capital, whether in the "private sector" or at the supra national level, at the IMF.

Ken Silverstein and Alexander Cockburn

Ken Silverstein and Alexander Cockburn write and edit *CounterPunch*, a Washington, DC-based newsletter. This editorial is an edited version of an article which first appeared in *The Nation*.

Crisis? What Crisis? The Ozone Backlash

First it was over the Antarctic. Then over the Arctic. Now scientists have announced massive ozone depletion in the upper atmosphere over Siberia and Europe, with ozone levels 20-30 per cent lower than normal. Studies released in 1994 and 1995 by the US National Aeronautics and Space Administration (NASA) also showed that depletion over the poles had outstripped predicted rates of ozone loss for the past three years — with record levels of ozone destruction over Antarctica. Models by scientists at the US National Oceanographic and Atmospheric Administration suggest that ozone depletion is triggering a series of self-reinforcing depletion cycles, with ozone loss causing still further ozone loss, resulting in geometric rates of destruction.

Biologists, too, are worried. As the earth's ozone layer thins, animals and plants are bathed in increased levels of ultraviolet-B (UV-B) radiation from the sun. Recent studies now link increased UV-B to damage to hardwood forests in Ohio; to the deaths of juvenile trout; and to damage to midge larvae, one of the key links in the freshwater food chain. In December 1993, research leaked from the US Environmental Protection Agency (EPA) presented substantial evidence that UV-B suppresses the immune system of animals and humans — regardless of their level of pigmentation and despite the use of sunscreens.

Yet even as the scientific community builds an increasingly alarming picture of the state of the earth's ozone layer and the biological impacts of ozone depletion, prominent opinion leaders, particularly in the US, have pronounced the ozone crisis "over". An "ozone backlash", which began in the early 1990s, is rapidly gaining ground and now has powerful allies, both in the Clinton Administration and in Congress. Official concern over ozone depletion has given way to complacency, research cuts and even attempts to strip back international controls on ozone-depleting substances.

In the spring of 1993, the EPA declined to act on appeals by NASA scientists to issue a public health warning about spending too much time in the sun after they discovered significantly decreased ozone levels over North America. A year later, the EPA began a tepid "Living Sun-Smarter" daily health alert that makes little mention of ozone depletion. In late 1993, DuPont, the US chemical giant, was persuaded by the Clinton Administration to continue producing chloroflurocarbons (CFCs) — the chemicals most responsible for ozone depletion — in the developed world for a full year beyond the date when the company had publicly committed itself to ceasing domestic CFC production. This was in response to pressure from vehicle manufacturers which still had not done sufficient work to find alternatives for automobile air-conditioners which use CFCs.

The greatest threat to action on ozone depletion, however, may well come from Congress, following the Republicans landslide victory in November 1994, which has made clear that it intends to dismantle health, labour and safety regulations. The Montreal Protocol, the 1987 international treaty that binds signatory states to phasing out ozone-depleting substances by the end of the century, looks certain to be an early target.

Rush to Destruction

A key figure behind the ozone backlash has been Rush Limbaugh, the ultra-conservative host of a public "talk radio" show, with an audience of some 20 million people. Lambasting the ozone crisis as a "scam" and a "hoax", Limbaugh bases most of his arguments on two books published in the early 1990s: *Trashing the Planet* and *Environmen*-



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Brochure: Skyros (TE), 92 Prince of Wales Road, London NW5 3NE. Tel: 0171 284 3063. tal Overkill, by the late Dixie Lee Ray, a former Governor of Washington State and former head of the US Atomic Energy Commission. Ray's information on ozone depletion comes from *The Holes in the Ozone Scare* by Rogelio A. Maduro. Maduro is an associate editor of 21st century, a magazine published by Lyndon Larouche, described by *Science* as "an extremist politician", who recently served a lengthy prison sentence for conspiracy to avoid taxes. Publicity material for *Holes in the Ozone Scare* urges the "overthrow of the murderous environmentalist regime now ruling our schools, governing institutions and the media", while Limbaugh accuses "environmentalist wackos" of being out to ruin the American way of life by banning CFCs.

The arguments put forward by Limbaugh, Ray and Maduro carry little scientific credence. Ray, for example, insists that because CFCs are heavier than air, they cannot rise into the stratosphere: in fact, as Sherwood Rowland, one of the first scientists to warn of the dangers of ozone depletion points out, the weight of CFCs is a red herring, since CFCs are largely carried into the stratosphere (where they have been measured in significant amounts in hundreds of tests for years) by the action of winds.

Nor is there any basis to Limbaugh's oft-repeated claim that ozone depletion has been limited to "occasional reduced levels of ozone over Antarctica". The reality is that substantially-reduced levels of ozone have regularly been measured over most of the globe, with the exception of the tropics. In February 1995, the World Meteorological Organization reported that ozone levels over Europe were 10-12 per cent below normal, while over North America, the deficiency was 5-10 per cent, with periods where levels were 20 per cent lower than normal.

Equally misleading is the assertion that ozone depletion is largely the result of natural phenomenon, such as volcanic eruptions, rather than industrial emissions of chlorine-based compounds. According to Limbaugh,

"Mount Pinatubo in the Philippines spewed forth more than a thousand times the amount of ozone-depleting chemical in one eruption than all the fluorocarbons manufactured by the wicked, diabolical and insensitive corporations in history."

Yet, as the Environmental Defense Fund, a Washingtonbased lobby group, points out, "Pinatubo's destructive effect on the ozone layer has been about *fifty times less* than that of CFCs, rather than a thousand times greater, as Limbaugh claims. Thus his estimate is off by a factor of fifty thousand." Moreover, all the chemicals emitted by Pinatubo were quickly washed out of the stratosphere by rain, unlike CFCs, which will remain in the stratosphere for at least a century. Indeed, the record levels of ozone depletion announced by the World Meteorological Organization in September 1994 occurred in the absence of volcanic dust from Pinatubo. What is not pointed out by Limbaugh and others is that natural phenomena, like the eruption of Mount Pinatubo, can seriously enhance the ozone-depleting ability of industrial chemicals already in the stratosphere.

Worse to Come

Despite such glaring holes in their arguments, Limbaugh, Ray and Maduro's revisionist views have been seized upon by journalists in the mainstream press and are now gaining increasing currency as the mood of many Americans swings to the Right. In 1993, for example, the *Washington Post* declared:

"After nearly a decade of headlines and hand-wringing about the erosion of the earth's protective ozone layer, the problem [of ozone depletion] appears to be heading toward solution before [researchers] can find any solid evidence that serious harm was or is being done."

Thanks to the Montreal Protocol, according to Boyce Rensberger, the *Post* journalist responsible for the story, the world has averted the "dark scenarios of environmental doom that were pronounced during the discovery of the Antarctic ozone hole."

In reality, the peak of ozone destruction is yet to come and the Montreal Protocol is losing steam at precisely the moment when steps are urgently needed to reduce ozone depleting chemicals in the atmosphere as quickly as possible. Ozone is destroyed through various complex reactions in the stratosphere involving a number of chemicals, the most damaging of which are chlorine and bromine compounds. These chemicals have "lifetimes" varying from a few years to a few hundred years. There is now a heated debate among bureaucrats and industrialists as to which chemical should be phased out when. Unfortunately, with the lack of public awareness on this issue, serious compromises are being made — just when we are learning that the potential for chlorine and bromine to destroy ozone will not remain constant.

One of the important conditions for ozone depletion is extreme cold in the stratosphere. The latest research suggests that as ozone is destroyed in the stratosphere, so the stratosphere becomes colder, thus increasing the rate of depletion. In this way, the amount of ozone destruction caused by a single chlorine molecule is accelerated, the ozone depletion itself creating the conditions for yet more ozone depletion. In addition, according to Jerry Mahlman, Director of the National Oceanic and Atmospheric Administration's Geophysical Fluid Dynamics Lab at Princeton University, global warming may enhance the ozone-depleting potential of chlorinebased compounds, threatening to boost ozone depletion to previously unthinkable levels.

The Holes in the Protocol

The key to reducing ozone depletion lies in reducing emissions of ozone-destroying chemicals to the atmosphere. Despite the agreement by 139 signatory nations to the Montreal Protocol to phase out CFCs by the end of 1995 and several other ozone destroying chemicals by the turn of the century, concentrations of chlorine within the stratosphere will continue to rise for several decades - and will not return to "normal" levels until well into the 21st century. This is because, ten years after the first ozone hole was officially recognized, emissions of CFCs are only just beginning to fall in the developed world. Meanwhile, in the Third World, where production of CFCs is permitted under the Protocol, CFC use continues to rise. Use of CFCs, moreover, is likely to continue long after they are officially phased out - a huge black market for CFCs has developed in the US, where, according to a US Customs' agent, they are the second biggest item of contraband into Port Miami after cocaine. In addition, the CFCs now in use in air-conditioning units and other industrial uses constitute a "bank" of ozone destruction that, despite efforts to control their releases, will delay the eventual elimination of these compounds from the atmosphere.

Moreover, the Protocol does not effectively cover CFC substitutes, many of which, though less damaging than CFCs, still deplete ozone; the so-called HCFCs are also powerful greenhouse gases. When HCFCs were approved by the Montreal Protocol as substitutes for CFCs, it was estimated that their ozone-depleting potential was just five per cent that of CFCs. If allowance is taken for their shorter life-span, however, that potential is four to five times greater than originally thought. In effect, use of the substitutes adds to the burden of ozone-depleting chemicals in the atmosphere — at a time when emissions of those chemicals need to be reduced as quickly as possible.

Fingers in the Pie

Some regulators and many atmospheric scientists are now talking about phasing out the substitutes to CFCs as quickly as possible: the Washington-based Institute for Energy and Environmental Research, for example, recently called for the worldwide elimination of HCFCs by 1996. Such demands are not well received by DuPont, one of the largest US producers of HCFCs and (until the end of 1995) CFCs or by many parties to the Montreal Protocol.

Having backed the substitutes, the Protocol is now pushing them through a fund, administered by the World Bank, that was intended to help Third World countries "leapfrog" damaging ozone-depleting technologies. As Greenpeace reports, 75 per cent of the grants made in 1994 for reducing ozone-depleting chemicals in the manufacture of foam, went to support technologies which used CFCs and HCFCs, while most of the projects in the domestic refrigeration sector supported CFC or HCFC technology — this despite the Bank's own advisers recommending cyclopentane, a chemical with no ozone-depleting potential and almost no global warming impact, as the most cost-effective alternative.

The pattern of grants approved by the Bank, and its advice to Third World countries, are unsurprising: its primary advisory panel on grantmaking, the Ozone Operations Resource Group, consists of seven representatives, all of whom are "closely associated with the chemical industry" and two of whom are in the employ of ICI, Britain's major manufacturer of CFCs and HCFCs. The dominance of industry is also evident within the conference of the parties to Montreal Protocol, where discussions about the timing of a phase out is now largely discussed in economic rather than environmental terms. According to Joe Mendelson, Director of the Ozone Protection Project for Friends of the Earth-US, "The Protocol is being driven solely by industry-defined technological possibilities rather than the dire consequences of continued ozone depletion." One top US Representative to the meeting said, "[ozone depletion] is not an environmental issue. It's an economic issue."

Capitalizing on the Backlash

For industry, resisting controls on HCFCs and other CFC substitutes has become a number one priority. In this, they have undoubtedly been well served by the mood of doubt and complacency engendered by the ozone backlash. Yet without action to reduce the chlorine load in the stratosphere, the earth and all its inhabitants will, on present evidence, be subjected to increasing levels of UV-B radiation, with potentially devastating results. The debate is not merely about science: as ever, it is about politics. It is time the environmental movement retook the initiative, countering the propaganda peddled by Limbaugh, Ray and Maduro, and exposing the agenda of those corporations who are now sheltering in the lee of the backlash.

John Passacantando and André Carothers

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Housing as Social Control in Tibet

by

Scott Leckie

Since the occupation of Tibet by the Chinese authorities in 1950, much of the country's architectural and cultural heritage, particularly in the capital, Lhasa, has been destroyed. In the past few years, many thousands of Tibetans have been evicted from their homes which have been demolished, while modern buildings have been constructed primarily for Chinese settlers. Such practices, combined with agricultural and economic reforms, are a continuing threat to Tibetan ways of life.

In 1950, the army of the People's Republic of China invaded Tibet. Nine years later, after an abortive uprising put down with a loss of 87,000 lives, the Dalai Lama, Tibet's spiritual and political leader, fled into exile. Many Tibetans regard the years of subsequent Chinese rule as years of repression and ecological destruction. Besides removing Tibet's art treasures, mining its mineral wealth and clearcutting much of its forests, the Chinese government appears to have attempted to "re-engineer" Tibetan society and ways of living. Integral to that process has been the encouragement of Chinese settlements in Tibet and the use of housing policies as devices of social surveillance and control.

In a process which the authorities describe as improving housing conditions, the government has evicted several thousand Tibetans from their homes and torn down their houses, demolished monasteries and other public buildings; introduced housing reallocation policies that have segregated Tibetans into crowded and decrepit ghettos, reconstructed whole towns and cities along easily-policed grid lines, and imposed new forms of housing many Tibetans consider inappropriate to local ways of living.

"Population Transfer"

Until the early 1980s, the government of China had a programme to move Chinese settlers into Tibet under a policy called "Giving Help to Tibet".¹ Many Chinese soldiers, police, professionals, workers and economic migrants — some displaced by development schemes in China itself — have moved to the country. Now, Chinese people are encouraged to settle by generous incentives, ranging from double rates of pay, to guaranteed housing (which is difficult to obtain in China itself), to the promise of three months' paid holiday for every 18 months worked. Some of the 1.2 million people who will be evicted by the massive Three Gorges dam being built on the Yangtze river may go to Tibet.² Tibetans themselves are estimated to number between five and six million people.³

The resettlement programme has led to unemployment for Tibetans and a devaluing of their skills; to the takeover of much of the country's best agricultural land so that, in some places, Tibetans have moved to less productive areas;⁴ and to *de facto*

Scott Leckie is co-director of the Centre on Housing Rights and Evictions and legal adviser to Habitat International Coalition. discrimination against Tibetans in housing, education and health care.⁵ One result is increasing numbers of homeless Tibetans.

Most of the new migrants have settled in towns and cities, but in rural areas of eastern Tibet, too, "population transfers" and discriminatory housing policies have resulted in severe hardship for local Tibetans. Although China's colonial presence in the countryside was, for many years, restricted to military settlements and administrative offices, rural areas of eastern Tibet are increasingly being opened up to settlers; large residential housing projects are now under construction in some remote areas and planned for central areas as well. In areas where large numbers of transmigrants have settled, so much arable land has been taken over to construct housing that many local Tibetan villagers are unable to support themselves on the remaining land. In the village of Gyatso, just outside Lhasa, the Tibetan community has been left with less than 10 per cent of their original cultivable land.⁶

Evictions and Segregation

Monotone cement compounds, built to house Chinese settlers and Tibetan officials working with the Chinese authorities, now dominate Tibet's towns and cities, which, increasingly, are segregated into Chinese and Tibetan quarters, the latter noticeably poorer in terms of housing and public services. As the UK Minority Rights Group reported in 1990:

"Most Tibetan towns are surrounded and even dwarfed by expansive Chinese sectors having walled compounds with running water and electricity. Tibetan quarters often lack running water or reasonable sanitation. In larger towns both sectors have electricity, but for Tibetans it is often rationed. In smaller towns and villages there is generally no electricity at all, unless they lie along a major highway and contain a Chinese compound."⁷

Such segregation has been accomplished through a combination of zoning policies, relocation and housing reallocation policies. Following the 1959 uprising, Lhasa was divided into three sections — south, east and north — and, for those deemed "undesirable", passage between the three area was strictly controlled: for years some family members living little more than a mile apart had no knowledge of each other. Soldiers from the People's Liberation Army "visited" almost every Tibetan house in Lhasa, evicting "rebels" and seizing furniture, rugs, kitchen utensils and food. Those who were unable to move in with relatives were permitted to stay in their old homes, but only if they lived with the livestock. Under the pretext of land reform, large areas of land around Lhasa (and other towns and cities) were expropriated to build army camps, detention centres and housing for settlers. Houses belonging to Tibetan nobles were also seized, either to be demolished or transformed into offices and, in some cases, prisons.

During the Cultural Revolution (1966-1976), thousands of monasteries and temples were destroyed, along with numerous Tibetan homes, in what many Tibetans regard as an attempt to obliterate outward signs of Tibetan culture and to break apart Tibetan communities.⁸ Traditional Tibetan two-storey houses, with the living quarters built above the sta-

Jirina Simajchlova/Tibet Image Bank

Old and new: the centuries-old Potala Palace overlooks an office of the Chinese national airline (CAAC).

bles on the ground floor, were decreed to be "bourgeois excesses" — in many cases, their inhabitants had to destroy their second storey living quarters and live in the damp, windowless stables below.

Demolitions and zoning policies have been accompanied by a feverish building programme which continues today. Since 1950, the Chinese central government has poured some 18 billion yuan (US\$3 billion) into construction programmes that have rebuilt large areas of Lhasa (and many other urban centres) along lines approved by the regime: boulevards wide enough for tanks to roll along have replaced the capital's narrow streets and passages, while the city itself now consists almost exclusively of commercial buildings and dormitory blocks. From a small town covering an area no larger than 3 km², Lhasa has expanded to 40 km², almost all of the new city consisting of settlements for Chinese administrators, military personnel, workers and settlers. The Tibetan quarter, known as the "old city", has been reduced to an area of less than 1 km².

Residence Permits and Identity Cards

Although a substantial majority of Tibetans now living in the Tibetan quarter of Lhasa wish to remain in their existing homes and neighbourhood, they have little say in where they live. Excluded from influencing rent levels, the design of their dwellings, the physical layout of the buildings and the surrounding environment, the type of architecture and building materials utilized and the overall shape of long-term development planning, Tibetans by and large have to live where the authorities decide.

Tibetans are required to carry identification cards with them at all times, and movement within the country, or changes in employment or accommodation, can generally be achieved only with government permission and the agreement of one's "work unit", which also provides housing. In Lhasa, work unit housing

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complexes range in size from 50 to 2,000 inhabitants, with employees of government institutions constituting the largest housing unit populations. Such housing generally consists of two small rooms, with an average occupancy of four persons. Private water taps and toilets are rare within work unit housing.⁹ In Lhasa, over two-thirds of work unit housing — which tends to be built with Chinese architectural methods — is inhabited by Chinese migrants.¹⁰

Selective enforcement of residence rules have enabled the authorities both to segregate Tibetans from Chinese settlers and to discriminate against Tibetans. As a Tibetan refugee stated in 1990:

"Tibetans wishing to move to towns such as Lhasa, Chamdo and Shigatse are often prevented from doing so, while Chinese settlers are actively encouraged to take up residence in these urban centres. All Tibetans without urban resident permits are thus effectively forced to remain where they are, notwithstanding the prevailing local economic or other circumstances. In May 1992, it was reported that resident permits were exchanging hands in the black market in Lhasa for over 5,000 yuan [\$800], a price far beyond the means of ordinary Tibetans."¹¹

No housing is available to those without a residence permit or an identity card. Moreover, households seeking public housing and other rationed services are generally required to belong to a work unit. Without a work unit, a person must obtain housing from the private market, an often difficult task.¹² Since Tibetans who have been evicted from their homes generally do not belong to a work unit, they are effectively denied access to new housing, even if they wanted to live in it. "Renovated" Tibetan housing is also denied to most Tibetans, since living in such houses requires special resident permits which they rarely possess. In addition, regulations introduced by the Chinese regime effectively prevent Tibetans from building their own homes — not least by requiring them to produce evidence of a bank balance of more than 10,000 yuan [\$1,600] as security.¹³

Unfit for Habitation

Lhasa's centuries-old Tibetan communities — once quite appropriate to dwellers' needs — have become increasingly unfit for human habitation. As those evicted move in with their relatives, it is not uncommon in the Tibetan quarter of Lhasa for 8 to 10 people to inhabit a small two-room dwelling. In many instances, they have no option but to live on the ground floor of courtyards that, prior to 1950, were used exclusively for animals and storage. Most Tibetan houses do not have indoor toilets; the public toilets are now so filthy that people relieve themselves on the unpaved cobblestone streets. Water, which used to be free to all residents, must now be paid for.

The unsanitary conditions have led to major outbreaks of diseases, many of them new to Tibet. As one Westerner who lived in Tibet during most of 1987 and 1988 reports:

"Because human waste and filth is so concentrated in the Tibetan part of town, and due to the lack of drainage, adequate sanitary facilities and garbage and waste removal, conditions of environmental hygiene are extremely alarming. Tibetan doctors told me that diseases such as tuberculosis and dysentery were virtually unheard of in Lhasa prior to 1959. There are at present a large number of cases of dysentery, as well as other intestinal problems which were non-existent or extremely rare prior to the Chinese takeover. During 1988 there was a typhoid epidemic, something which doctors said had never occurred previously. So in my opinion, it is clear that the housing and living conditions of most Tibetans has contributed substantially to the worsening health situation."¹⁴

Those evicted from their homes who do not have relatives, extra money or good guanxi (backdoor connections) now face major housing problems. In mid-1992, according to the Tibetan Underground Group Policy on Foreign Investment, the number of homeless Tibetans in Lhasa exceeded 2,000 families, despite hundreds of new buildings under construction to house Chinese migrants.15 The real figure of the homeless is likely to be even higher, since many of those living with relatives, though they have a roof over their heads, are effectively homeless, lacking the resources, access or connections necessary to acquire a home of their own. Others who lack official resident permits do not show up in the official (or unofficial) figures - but judging from the numbers of beggars, unemployed migrants or pilgrims periodically expelled from Lhasa, they add considerably to the numbers of homeless. In the largest such expulsion, carried out in mid-1989, 40,000 Tibetans were ordered onto trucks and driven from Lhasa to their native villages.16

Further Clearances

Having brought about much of the overcrowding, homelessness and deprivation in Lhasa and other cities, the Chinese government has used the appalling conditions in which many Tibetans live as a pretext for yet more urban clearances. In the name of improving water and sewage amenities,¹⁷ "hazardous housing" has been "renovated" — in practice, demolished — and large areas of the old city of Lhasa have been razed of houses deemed "on the verge of collapse".¹⁸ In 1990, the mayor of Lhasa launched a major clearance programme in the old city; more than 10 per cent of the remaining two-storey stone housing, much of it over 200 years old, was flattened by bulldozers.¹⁹The mayor declared that by the end of the year, he hoped to be able to announce that there were "no old, dangerous houses in Lhasa."²⁰

Observers are sceptical of claims that the old houses were "in danger of collapse, unsafe or unhygienic". Independent surveys of houses destroyed in the 1990 clearance revealed that, while perhaps in need of renovation or repair, the overwhelming majority did not require demolition or rebuilding as vulgarized "Tibetan-style" dwellings.

Such rebuilding has been justified in terms of "modernizing" the capital and building a "beautiful and charming sacred city".²¹ But many analysts believe that the true motivation behind the destruction lay in the regime's wish to create roads wide enough for easy police and troop movements, it having proved difficult to control crowds during protests in old Lhasa's maze of narrow passages. The demolitions and evictions have also enabled the Chinese regime to keep the Tibetan community under better surveillance. Chinese-paid informants, for example, have been rehoused within traditional Tibetan courtyards, creating distrust and uncertainty among neighbours: as one evicted resident complained, "Now we cannot know who is beside us, below us or above us."²² Housing compounds, complete with guarded gates that are locked in the evenings, have also been built, allowing easy surveillance of those who come and go.

The Master Planners

Many of these evictions and demolitions have taken place under the Lhasa Development Plan, approved by the Chinese State Council in 1984, under which the "reconstruction" of Lhasa will be completed by the year 2000. The principal planning objective is "the transformation of the old city" through "readjustment" (*tiao zheng*) into "a modern socialist city with local national characteristics,"²³ a city that is "relatively perfect, beneficial for production, convenient for daily life, rich, civilized and clean".²⁴

The Plan divides Lhasa into three sectors: the city centre, the northern district and the western district. Population figures are given for the northern and western districts — 40,000 and 50,000 people respectively — but none are provided for the city centre, which includes the Tibetan quarter, a range of administrative offices and the Tibet Autonomous Region's party head-quarters. Given that the Plan envisages a total population of 200,000, some postulate that the city centre may be used to house up to 110,000 people, greatly increasing overcrowding and inadequate housing.²⁵

If the Development Plan is implemented, the Tibetan quarter of Lhasa will effectively cease to exist. In the Plan's drawing for the year 2000, the old city has been consumed by an amorphous mass of modern Chinese buildings with "Tibetan characteristics".²⁶ Only the Jokhang and Ramoche Temples, Tibet's oldest places of worship and the religious centre of the country, and a handful of historic homes have been earmarked for preservation as "cultural relics" — in keeping with the mayor's intention "to leave a few examples of traditional Tibetan architecture, here and there, as a souvenir."²⁷

More than half of the older houses in the area around the Jokhang Temple known as the Barkhor have already been demolished. Some 5,000 people have had to move from Barkhor and Shöl, the neighbourhood at the food of the Potala Palace, the former home of the Dalai Lamas; a further 10,000 are scheduled for eviction. A tourist and shopping plaza to replace Shöl village

Agricultural Modernization and International Aid

In line with the goal of "economic reform", the Chinese authorities have drawn up an agricultural master plan for central and eastern Tibet, known as the One River Two Streams (ORTS) programme, which aims to replace the subsistence rural economy with a market-oriented one.

The ostensible objectives are to increase grain output, primarily wheat, and rural cash income by introducing irrigation and modern agricultural techniques and by linking agricultural production more closely to the market by persuading farmers, for instance, to grow and sell cash crops. Many critics, however, believe the plan is being used to eliminate traditional farming and the rural economy, which will, in turn, change much in Tibetan ways of life and culture. Indeed, the tenacity with which many Tibetans have maintained their agricultural methods. despite previous attempts by the Chinese authorities to modernize farming, reflects not only their conviction that, under Tibetan conditions, traditional methods are superior, but also a determination to maintain their Tibetan identity.

Cultural Revolution Agriculture

Traditional agriculture and animal husbandry account for 90 per cent of economic activity in Tibet and is the occupation of most of its people. In the north and west, nomadic pastoralism is the main system of land use, while to the south and east, a wetter and milder climate supports more crop cultivation. Effective irrigation canals and high-yielding varieties of highland barley, suited to specific localities and cultivated in rotation including fallow periods, have been developed over centuries. These traditional methods are well adapted to the poor soil fertility. harsh weather conditions and short growing seasons - the Tibetan plateau is more than 3,500 metres high.

Animal husbandry supplies meat, milk, butter, wool, hair, skin, fuel and manure; yak-dung is the main

Farmers threshing barley at Samye

fertilizer used. Grain is bartered or exchanged for pastoral products and salt produced by the nomadic herders within trading relationships sustained over many generations among different groups.

In the 1960s, chemical fertilizers and pesticides, large-scale irrigation and intense cultivation of non-indigenous crop varieties, wheat in particular, were introduced. Some 80 per cent of arable land was ploughed for wheat with disastrous consequences, not least because wheat is not suited to the Tibetan climate. Failed harvests, together with food exports to China, led to the first famines in Tibetan history. Traditional grazing and nomadic migrations were also forbidden, causing extensive overstocking, overgrazing and desertification.

Tibetan Agriculture Revives

In 1980, however, agriculture and pastoralism in Tibet were "de-collectivized": the land remained state property but was distributed to individual households under the "responsibility system" which left farmers and herders with some degree of control over decisions concerning crop and livestock production, varieties, output and sale or exchange of surplus on the open market. As a result, most Tibetan farmers stopped using chemical fertilizers and farm machinery and resumed traditional patterns of agriculture in much of the countryside. Largescale irrigation schemes and reservoirs built in the 1960s and 1970s were abandoned and are now disused. Farmers have also reverted to bartering with nomads.

In one of the few independent

surveys of contemporary Tibetan agriculture available (conducted in Nyemo county in 1987), author Zhang Rongzu notes that:

"the system of household responsibility seems to have provided some farmers . . . with an opportunity to return to old methods of tilling their land. Recently, a reduction in the use of tractor plough was noticed, and a reappearance of 'two yak pulling a wooden plough' has been reported in the county. The author also met local people who were

asking Buddhist priests to pray for a good harvest . . . The farmers do not like to change their traditional cropping system too much. It has already attained a higher yield level, and they prefer the local variety of *qingke* [the Chinese name for Tibetan highland barley] . . . The agricultural system in Nyemo, even with the environmental limitations, is that of a rural economy which is selfsufficient in food".

Most of the taxes on rural Tibetans were also lifted in the 1980s, leading to an increase in cash income (from an average of 127 yuan in 1979 to 220 yuan in 1982 at a time when 4 yuan were roughly equivalent to \$1). Although a free market for rural produce quickly emerged, it soon stabilized at a limited level: average rural income remained at 300-400 yuan during the late 1980s, lower than any province in China.

"Transforming" Agriculture

When the "responsibility" system was introduced in 1980, it was described as a "breathing space" to last 10 years. It is still largely in place today, although more restrictions and obligations have been imposed, varying from county to county. Quota taxes were reintroduced in the late 1980s for all rural producers. Usually amounting to between 5 and 20 per cent of annual production - grain for farmers; butter, meat, wool and hides for nomads - for sale at state prices, these are becoming an onerous burden for most households, as market prices have increased drastically with inflation while state prices remain unchanged. Most counties

now oblige farmers to use chemical fertilizers as part of the quota system while in some areas, grain quotas have to be fulfilled in wheat rather than the traditional barley.

In the early 1990s, the central and regional governments started to pursue all-out economic growth in Tibet. The Chinese official news agency, Xinhua, reported that to develop Tibet's rural economy, the state had financed irrigation to "transform" about 50,000 hectares of farmland, primarily to grow wheat for sale, and fenced up to 267,000 hectares of grassland for livestock grazing. It had helped local farmers to replace wooden ploughs drawn by cattle with machinery and introduced "agro-science to modernize their traditional ways of farming". Furthermore:

"local governments introduced 'economic and trade' contents to the numerous ethnic traditional festivals . . . so that the Tibetan peasants and herdsmen could experience a new way of spending the festivals."

One newspaper article reports that farmers are expected to change their dress habits from home-made clothing to bought leather jackets and Western-style suits and skirts, all manufactured in China.

One River Two Streams

The overall economic development plan for central and eastern Tibet has been laid out in the 10-year, One River Two Streams (ORTS) programme covering four main river valleys. The programme envisions the creation of a core region in Tibet where new industries and enterprises will be encouraged and economic growth concentrated. According to Xinhua:

"The 18 counties in the central part of the region have been designated as the 'bread basket' of the [Tibet] autonomous region. A comprehensive agricultural development programme is now being initiated with two billion yuan from the central government . . . A group of manufacturing and processing enterprises has shot up in the area as energy and communications facilities have been greatly improved, making it a major production centre of commodity grain, vegetables and foodstuffs, textiles and light industry".

A feature item on the ORTS programme

in the *Peoples' Daily* states that: "agriculture in Tibet's river basin has undergone unprecedented change, with the traditional production modes of Tibetan agriculture being phased out... This [ORTS] programme that straddles the next century will enable the middle reach basin of the three rivers to take the lead in ending the thousand-year state of natural farming and herding".

International Aid

Apparently unaware of its full implications, the European Union and the World Food Programme (WFP) under the UN Food and Agriculture Organization (FAO) have both given active support to the Chinese government's agricultural programme in Tibet.

The WFP launched a five-year, \$7 million pilot project - part of a longerterm scheme called "3357" - in the Lhasa river valley in 1989. Criticism from some of WFP's own consultants. among others, however, led the WFP to withdraw from the project in 1994. Numerous Tibetan refugees have reported that the authorities have been "fooling the UN and diverting all the money" away from intended Tibetan employees and beneficiaries of irrigation construction towards Chinese immigrant workers. It is widely believed that Project 3357 is part of ORTS. Tenzin Atisha, a representative in charge of environmental affairs for the Central Tibetan Administration in Dharamsla, said in May 1994 that the WFP project was:

"a key facet of China's colonization and expansion plans in the region. We now believe that [the project] is almost certainly being used to develop infrastructure required to support ever increasing levels of Chinese immigration and settlement in the rural areas of Tibet. These population transfer policies and goals now pose an urgent and significant threat to the survival of the Tibetan people and our culture. However well intended this project might originally have been, corruption and the misappropriation of UN funds are now . . . deeply embedded into its delivery".

In October 1994, the European Commission approved a 7.6 million ECU grant (US\$10m) for financial and technical assistance for a new phase of ORTS, primarily for construction of a pumped irrigation scheme to increase grain output, in the fertile Panam county in the prefecture of Shigatse, the second largest city in Tibet. The grant represents about one-third of the EU's total aid budget for China and acc-ounts for one-third of the total cost of the five-year project in the mountain-valley area. In a February 1994 draft proposal, EU officials concluded that:

"local farmers must now become more market-sensitive as with increased production they will be moving from a largely subsisted to a market economy".

One independent witness has described the project as "an internationally endorsed attack on the traditional rural economy" of Tibetan subsistence farmers, while a representative of the UK-based Tibet Support Group has said that:

"This project is being directed into a region where . . . considerable effort has been made to . . . generate crop surpluses required to feed a higher number of Chinese immigrants".

A former consultant on the project maintains that:

"the soil may look rich, but it will dry out from excessive farming and farmers will then need a lot more fertilizer to increase harvests even by a small amount . . . Within a decade the land . . . will become a desert if this Project goes ahead".

The Tibet Support Group concludes that:

"aid of this kind rubber-stamps China's long-term population transfer and settlement activities — two key facets of its strategic colonization and expansion plans in Tibet . . . We are far from certain as to whether the EU has given any serious thought to the political context within which they are endorsing this programme."

Even though it is at present uncertain whether the EU will go ahead in Panam, the involvement of international aid agencies in Tibet can only be taken by Tibetans as a sign that business with China is now more important to Western countries than concern over human rights. International aid and approval has bestowed on the ORTS programme kudos and dignity, the propaganda value of which has been fully exploited by the official media.

This box is based on articles, available on request, by Patrick Peatfeld & Hannah Pearce. **Patrick Peatfeld** is an independent researcher on Himalyan affairs; **Hannah Pearce** is a freelance environmental journalist and film-maker. is now under construction, due for completion by the beginning of September 1995, in time for the celebrations planned to mark the thirtieth anniversary of the re-naming of Tibet by the Chinese authorities as the Tibet Autonomous Region.

Other building activities in the Tibetan quarter in Lhasa have escalated markedly. The total number of housing units under construction in the area in late 1993 exceeded 500. The units house approximately 2,000 persons, mostly in municipal flats. Government housing projects on the demolished sites are largescale and tend to occupy more than one site. Surveys in 1990 and 1993 found that water and sewage facilities in the new public housing units were minimal with 30-40 units sharing one courtyard tap. In addition, the concrete breeze block and cement housing cannot withstand earth tremors or the extremes of

Tibet's climate. Some Tibetans have commented that because the new housing is difficult to heat and has poor insulation, there has been an increase in respiratory illness, especially during the winter.

Some Tibetans now living in the new smaller housing units object to changes in eating and sleeping habits which have resulted from reduced space and facilities as well as to changes in household religious practices because of the lack of space for an altar room. Some also complain of the lack of space for outdoor work or activities in the smaller, overcrowded courtyards. Relocation from small compounds to larger apartment blocks has tended to break up extended family networks and other longstanding forms of social association.²⁸

Socialist Modernization

Far from improving living conditions in the Tibetan quarter, the "reconstruction" of Lhasa has brought new problems for Tibetans. In May 1993, eyewitnesses claimed:

"Those evicted are routinely relocated to concrete block apartments often half

the size and up to ten times the monthly rent of their original homes. The apparent goal is to raise increased revenue for the State from what is considered Lhasa's prime real estate, and to provide housing for the dramatically increasing numbers of settlers from mainland China. The effect has been to drive Tibetan residents who cannot afford the exorbitant new rents to the outskirts of Lhasa, where there is little opportunity for businesses, and to populate what were once historical landmarks with Chinese entrepreneurs who monopolize the tourist trade."²⁹

Many of these entrepreneurs have migrated to Tibet since 1992 when the regime launched its programme of "Socialist Modernization". In line with market reforms taking place in China (see Box pp.14-15), the programme is aimed at developing the private sector economy, generating more energy and promoting industry, as well as making Tibet more accessible to China's economy through infrastructure development as a means of solving Tibet's "problems". These are perceived as two-fold: the poverty and "backwardness" of the region, despite large subsidies from the Chinese government; and the need to integrate it more closely with China because of its physical remoteness and the questionable loyalty of its people.

Controls on internal movement of Chinese have been relaxed and residence permits waived in favour of migrants from the Chinese provinces adjacent to Tibet. The majority of the new migrants work in the commercial and retail sectors, whereas previous settlers have mainly been soldiers, officials, technicians and engineers. The Chinese official news agency reported in August 1993 that 1,700 new businesses had opened in Lhasa since the beginning of the year under "a series of preferential policieswhich encourage the rapid growth of the private sector". In 1993, only 10-15 per cent of shops and business in Lhasa were Tibetanowned, 8-9 per cent government-owned and the remainder run by Chinese settlers.³⁰ The economy of rural Tibet, where much of the

bureaucracies — often acting in alliance with private capital — with a powerful

means of attempting to increase their control over ordinary citizens.

trade has traditionally been carried out by nomads, has also been affected by these new migrants; in particular, Hui traders from neighbouring provinces in China have been buying up the nomads' surplus products such as wool and sheepskins. Several incidents of protest and unrest seem to have been started by local attempts to evict Hui traders.

The traditional Tibetan economy is being increasingly marginalized, as artisans cannot compete with the flood of cheaper, mass-produced imported goods. One observer has estimated that "in the face of overwhelming pressure from the modern sector, Lhasa's local economy may soon be extinct".³¹ In June 1994, several hundred Tibetan traders from the Barkhor area protested in front of the municipal government building against 50 per cent increases in the local business tax. "Nowa-days China is opening up the whole of Tibet on the pretext of economic development, but in reality it is in order to deny Tibetans rights and work through the endless transfer of Chinese people to live here," comments a Tibetan underground group. "Anyone who has eyes can see houses for Chinese being constructed everywhere in great haste."³²

"Getting Rich is Glorious"

It is not just in Tibet that the Chinese authorities have promoted economic development at the expense of people's livelihood and the environment. Since 1978, the government under Deng Xiaoping as been opening up China itself to economic market reforms, encouraging the Chinese to strive for a US-type consumer lifestyle under the slogan "getting rich is glorious".

China's economy has grown by an annual 13 per cent since 1992 after a decade in which annual growth in GNP exceeded nine per cent. Since 1978, average rural cash incomes have grown more than sixfold while urban incomes have more than tripled. *The Economist* recently estimated that substantial disposable incomes should:

"create some of the biggest business and financial opportunities in history, and far-sighted Western firms and their workers stand to profit immensely from this."

Unemployment

China's transition to a market economy is, however, creating as many problems as it solves. Some 41 million people in China are officially unemployed, but independent estimates claim more than three times that number are without jobs. At least one-fifth of the 120 million people working in state industries are threatened with layoffs. Close to half the rural workforce of 430 million is said to be redundant. According to China Daily, some 80-100 million of these comprise a "floating population" of migrant labourers who sweep back and forth across the country in search of work, sleeping under bridges, in train stations and in the shantytowns growing up around many Chinese cities. By the year 2000, the pool of rural unemployed will reach almost 300 million.

Half the state-owned firms are bankrupt. An estimated 10 per cent of state sector workers are either not getting paid on time, or not at all. Unemployed workers are getting less than \$10 per month in benefits, and many pensioners have lost their state support. In the past two years, hundreds of thousands of workers have staged strikes, slowdowns and sit-ins at state-owned factories throughout China, protesting at worsening conditions. One official in the industrial city of Tianjin said, "The poverty of the workers is just like dry wood. Once you set fire to it, it will be a conflagration."

In the joint-venture sector, foreign investors and their Chinese partners are recreating working and living conditions not seen since the Industrial Revolution in Europe. Lured by the availability of millions of workers fresh from the countryside, factory operators "feel free to do things that would land them in jail in the advanced industrial world". In special economic zones, child labour. compulsory overtime and beatings of workers are routine. Health and safety procedures are nonexistent or disregarded. Officially, 13,385 workers died in factory fires and industrial accidents in 1993, up from 7,633 in 1991, most of them in the coastal special economic zones; by August 1994, another 19,000 deaths had been officially recorded. Labour activists say the real toll is far higher.

Polarization

For the employed, incomes are up, but so is the cost of living. With deepening market reforms, state subsidies are being slashed so that state sector employees are being forced to pay for housing, medical care and other goods and services that used to be rationed or subsidized. *China Daily* reports that privatization of the social welfare system is at the top of the government's agenda, including dismantling the system of free medical care. In addition, ever-mounting government debt to fund bankrupt state firms is propelling double-digit inflation.

In consequence, the market system is fast replacing Mao's "poor but equal" egalitarianism with stark social polarization. In China's cities, wealthy entrepreneurs, traders, smugglers, "red capitalists" and corrupt cadres lord over the poverty of millions of migrant workers, many of whom are being driven from destitution to begging, crime and prostitution.

A vicious society-wide struggle over property has also been unleashed, led by Party cadres and the children of Deng Xiaoping and other leaders: before 1978, such individuals were powerful, privileged but propertyless; now they are striving to convert their power into private property. Since the 1980s, they have plunged into corruption, embezzlement, smuggling, expropriation and theft of state funds and the privatization of state enterprises and properties to amass personal fortunes. The associated violence has already caused many deaths and rendered travel unsafe in many areas.

Environmental Degradation

Scientists have observed that "no country in history has undertaken an economic and industrial revolution on an ecological foundation in such a degraded state" as China has. In a country where only 10 per cent of the land can be cultivated, about onethird of the cropland has been degraded over the past 40 years because of overfarming (soil erosion. desertification), energy projects (hydropower stations, coal mining) and industrial and housing construction. Water supplies are drving up under the heavy demands of industries, agriculture and domestic use. Of China's 500 cities, 300 are short of water and 100 "seriously short." By the turn of the century, the "water deficit" for the country is projected to be equal to Mexico's consumption in 1990

China's factories discharge some 36 billion tonnes of untreated industrial waste water and raw sewage into the country's rivers, lakes and coastal seas each year. Four-fifths of China's rivers and lakes are "seriously polluted", their waters unfit for drinking and their fish unfit to eat. China's agriculture ministry has reported that more than 100,000 people were poisoned by pesticides and fertilizers during 1992 and 1993; more than 14,000 of them died.

China also now faces a solid waste crisis. Whereas almost everything used to be recycled, the mass promotion of consumer culture in the 1980s, accompanied by much packaging and disposable containers has led to a glut of garbage in most China's cities. By 1990, more than 10,000 dumps had been built. More than seven billion tonnes of rubbish, little of which is recycled or treated to remove toxins, fill up some 600 square kilometres of land.

China's industrial emissions of greenhouse gases, particulates and heavy metals are increasing

exponentially. If present trends continue, China will be the world's largest producer of acid rain and the world's largest emitter of greenhouse gases shortly after the year 2000, belching an additional US's worth of particulate emissions into the air and a Western Germany's-worth of sulphur dioxide emissions. Scientists estimate that even if China's industry grows at only 8.5 per cent per year (less than half its current rate of growth), by the year 2025 China will produce three times as much carbon dioxide as the United States. Already, the smog is so dense that whole cities routinely disappear from the

view of orbiting satellites. China's National Environmental Agency reported in June that air pollution is causing a sharp increase in deaths from lung cancer, which climbed 18.5 per cent in the major cities from 1988-1993. According to the Agency, the leading cause of death in China is polluted air. Mercury and lead poisoning is on the rise among children.

To counter such trends, China could take advantage of its "underdevelopment". For example, it could build on the strength of its comprehensive trainbicycle system of public transport, the most energy efficient as well as the least polluting method of mass transit yet developed. It could also take advantage of its organic-based agriculture and so avoid the destruction of top-soil and the pollution, cancers and other health costs resulting from chemical-intensive agribusiness. China could also take advantage of its legendary tradition of conservation and recycling and thereby avoid the inevitable solid waste disposal crises that afflict capitalist countries.

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Housing Rights

Taken individually or as a whole, the planning policies of the Chinese government in Tibet constitute grave breaches of the housing rights of the Tibetan people, as enshrined in international law. Other states have already been officially criticized by the United Nations for planning and housing abuses that, though no less excusable, are less repressive and discriminatory than those being inflicted on Tibet. Yet no UN resolution or action has been directed at the government of China for its human rights or housing rights record in Tibet. Although there should be no false illusions that mere reference to housing rights violations in Tibet will necessarily result in meaningful changes in the conditions confronting many Tibetans, the longer the international community hesitates to apply international law, the greater the remoteness of changing the injustices carried out in Tibet in the name of "planning, progress and development".

This article is an edited extract from *Destruction by Design: Housing Rights Violations in Tibet* by Scott Leckie, published by the Centre on Housing Rights and Evictions, Postbus 15100, 3501 BC Utrecht, THE NETHERLANDS, price \$7 for those in the Third World, \$15 in the First World.

Notes and References

- "TIN Summary (BB)", Tibet Information Network, London, 25 May 1990, p.11. The Chinese government claims that Tibet became an integral part of China 700 years ago and accordingly rejects any allegation that it has occupied the country. See *The Legal Status of Tibet: Three Studies by Leading Jurists*, Office of Information & International Relations, Dharamsala, India, 1989, p.vi; van Walt van Praag, M., *The Status of Tibet: History, Rights and Prospects in International Law*, Westview Press, Boulder, CO, 1987. The Central Tibetan Administration of the Dalai Lama believes that "the basic intent of Tibet's 'development' by China is to support the Chinese population in Tibet, provide raw materials and products for China's industries, and income for China's profits". See *Tibet: Environment and Development Issues*, Department of Information and International Relations, Central Tibetan Administration, Dharamsala, India, 1992, p.3.
- See Xu Chengshi and Zhong Bu, "Yangtze Exodus Begins", Panoscope, No 37, London, October 1993.
- See, for instance, Asia Watch, Merciless Repression: Human Rights in Tibet, Washington, DC, May 1990, pp.73-79.
- Lowe, J., "The Scorched Earth: China's Assault on Tibet's Environment", Multinational Monitor, October 1992, pp. 15-19.
- 5. Statement by Disabled People's International, Human Rights Advocates, International Federation of Human Rights, International Federation of Rights Violations, Pax Christi, International Education Development Inc. and Liberation, "The Situation in Tibet: A Survey of Current Human Rights

Violations, Including Denial of the Right to Self-Determination", UN doc. E/ CN4/1992/37, p.37.

- Chinese People's Political Consultative Conference of Lhasa City Committee Conference Secretariat, 15 July 1993, Bulletin No 2, Official Document; "TIN Document 8 (YR)", Tibet Information Network, 1993.
- Statement by the Minority Rights Group, UN doc E/CN 4/1990/NGO/9, 24 January 1990.
- Most figures claim that 6,000 temples and monasteries were totally or partially destroyed throughout Tibet.
- 9. Tibet Information Network, Document No TMP4/NE/NE.DOC, 1992, p.2.
- Rong Ma, "Han and Tibetan Residential Patterns in Lhasa", China Quarterly, No 128, 1991, pp.822-823.
- 11. "TIN News Update", Tibet Information Network, 3 December 1992, London.
- US State Department Human Rights Country Reports, China Chapter, 1990, p.8.
- 13. Statement from a source in Lhasa, June 1993.
- 14. Interview with the author, 15 August 1989.
- "Statements on Economic Investment from Tibet", Tibet Information Network, London, 1992.
- Tibet: Proving Truth from Facts, Dept. of Information and International Relations, Central Tibetan Administration, Dharamsala, 1993, p.46.
- "TIN News Update", Tibet Information Network, 30 April 1990, London, pp.5-7.
- Liu Tung Fen and Wangdu, "How are you improving the living standard of the Tibetan people?: Interview with Loga, Major of Lhasa Municipality", *China's Tibet*, Spring issue, 1991, pp.7-16.
- 19. "TIN News Update", op. cit. 17.
- 20. Renmin Ribao (in Chinese), Beijing, 25 March 1990, p.3.
- 21. "General Strategy of the City of Lhasa", Lhasa Evening News, 9 March 1991.
- 22. "Knocking Out", South China Morning Post, 8 December 1990.
- 23. Document No 31, Party Central Committee, Lhasa, 1980.
- CCP Central Committee Document No 31-1980, 1985, cited in Grey, J., "Modernise, Or Else! Building the New Lhasa", *Himal*, January/February 1995, p.11.
- 25. "To Build a Beautiful and Charming 'Sacred City' Reflection on the Achievements of the Past 40 Years of the Municipal Construction of Lhasa City", *Lhasa Evening News*, 9 March 1991.
- 26. South China Morning Post, op. cit. 29. Cosmetic and superficial Tibetan additions have been attached to the exterior of many new buildings in the old quarter, making them indistinguishable from old Tibetan-style buildings to casual tourists. However, the structural design and building materials are those of current Chinese building practice, involving pre-cast concrete slabs, single layer walls and large windows which, because of the climatic conditions in Tibet, are likely to deteriorate rapidly and encourage damp and cold. See "Demolition and Reconstruction in the Old Quarter of Lhasa 1993: TIN Background Briefing Paper No 23", Tibet Information Network, 8 November 1994.
- Stoddard, H., A Report on the Protection of Tibetan Cultural Heritage, Paris, 1992, p.6.
- 28. See "TIN Background Briefing Paper No 23", op. cit. 26.
- 29. "TIN Document", Tibet Information Network, London, 21 September 1993.
- 30. Grey, J., op. cit. 31.
- 31. Ibid., p.16.
- 32. Cholsum Thuntsok, cited in ibid., p.13.

Ecolabels

The Industrialization of Environmental Standards

by

Karen West

Ecolabels are seals of approval given to manufactured products deemed to have fewer impacts on the environment than functionally and competitively similar products. But far from encouraging industry to strive for higher environmental standards, voluntary ecolabelling schemes are rapidly degenerating into a means whereby industry can set the standards it likes. Whilst some products and processes have undoubtedly been improved, overall ecolabelling is proving to be an extremely blunt instrument for environmental protection.

As environmental issues became the object of public concern in Western Europe and North America in the 1970s and 1980s, citizens were urged to use their purchasing power to pressure industry to reduce its negative impact on the environment. The rise of "green consumerism" quickly led to an explosion of green claims by companies eager to tap this purchasing power. "Eco-friendly", "environmentally safe", "recyclable", "biodegradable", "ozone friendly", "safe in a landfill" and "safe for incineration" were just some of the claims which manufacturers bombarded consumers with.

Many of these claims were misleading or false, exaggerating the "eco-friendliness" of products. Some companies gave the impression that an entire product was "eco-friendly" when actually only a small component had an environmentally-benign attribute. Some stated that a product was free of particular toxins or contaminants, when it had never contained any of them. Others simply failed to substantiate a claim.¹ One result was a decline in consumer confidence in "eco-friendly" products.

In response to pressure from both consumer organizations and industry to intervene in the confusion, many governments eschewed mandatory controls in favour of voluntary "ecolabelling" schemes.² Under these schemes, a product would be "objectively" assessed as to its "eco-friendliness" by an "independent" body which would award an official seal of approval — an ecolabel — if it met an agreed set of criteria. With the consumer thus enabled to make an informed choice between products, market forces could be harnessed for environmental ends, promoting better industrial practices and reducing product-related environmental impacts.

The earliest scheme was Germany's Blue Angel scheme - so called because it adopted the Blue Angel logo of the United Nations Environment Programme as its emblem - which was established by the German Federal Environment Agency in 1978. Since then, most OECD governments - with the exception of the US, where a private initiative known as "Green Seal" operates3 — have set up ecolabelling schemes, the European Union (EU) launching its version in June 1993. In the South, a number of countries have developed ecolabels or are in the process of doing so. Worldwide, there are now some 30 schemes in operation.

Apart from the Blue Angel scheme, no ecolabelling scheme is more than seven years old. Indeed, the recent flood of schemes has led the International Standards Organization (ISO) to consider developing a global ecolabelling standard to facilitate trade in ecolabelled products.⁴ The environment directorate of the Organization for Economic Cooperation and Development (OECD) has also looked into this issue.⁵

The German scheme, the model for most other schemes, was never intended to play more than a modest role in environmental protection. Its architects recognized that it could only work within a robust regulatory framework, in which environmental quality standards for products and processes were enforced. There is now, however, growing interest, particularly in the EU, in expanding the role of ecolabelling and other voluntary market instruments to substitute for le-gally-binding regulations.⁶

Industry Domination

In most schemes, the body which decides on the types of product for which ecolabels will be made available and on the criteria for assessing whether such a product should be granted an ecolabel comprises representatives from industry, consumer groups and environmental groups. In practice, the needs of industry often takes precedence over those of other interest groups in the decision-making process. As a result, ecolabelling schemes are rapidly degenerating into a means whereby industry can set the environmental standards it likes.

In the European Union, ecolabelling boards are required to ensure that their composition "is such as to guarantee their independence and neutrality."7 EU regulations, however, give little or no guidance as to how "independence" and "neutrality" are to be ensured. Nor is there any attempt to specify the mix of interests between industry, consumer organizations and environment groups permitted in the decision-making process. In the German Blue Angel scheme, profit-making organizations are not permitted to participate directly in decisions on criteria.8 In many countries, however, no such rules apply.

Industry has a greater direct stake in ecolabelling decisions than other interest groups, as well as the time and resources to ensure its interests are defended.

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Life Cycle Assessment

Ecolabelling criteria should, in theory, address the full impacts of a product from manufacture to final disposal. At present few do so. Yet even the "life cycle assessments" which have been made have generated considerable controversy.

One reason is that there is no accepted methodology for assessing and comparing different ecological impacts. Many impacts such as soil erosion and the loss of biodiversity are skimmed over while the ecological impact of "renewable" resources, such as cotton, are often ignored entirely - even though their production is energy intensive and heavilydependent on toxic chemical inputs and monocultures. Similarly, life cycle assessments often fail to assess products to "the point where the product and the emissions are back in their original state as part of nature." Many of the most severe impacts are explicitly excluded. The guidelines issued by the US Society for Environmental Toxicology and Chemistry, for example, exclude social impacts, such as human rights abuses, whilst animal testing has not been considered in some product categories in the EU scheme on the grounds that it is an ethical, not an ecological, issue.

Environmental and consumer organizations, by contrast, have few resources or personnel to give detailed consideration to product criteria or to attend lengthy working group sessions. For many nongovernmental organizations, participating fully in ecolabelling schemes (either as permanent members of ecolabelling committees or as consultants on drafting criteria) is a diversion from the more important task of ensuring that the public and the environment are protected through legally-binding regulations.

One result is that many ecolabelling boards have been captured by the very groups whose products are to be assessed. In Britain, for example, members of the UK Ecolabelling Board, which administers the EU scheme in Britain, are selected by the Department of the Environment and the Department of Trade and Industry. Although any individual with sufficient expertise can register their interest in being a member, in practice, industrial interests have played a disproportionately large role in the decision-

Industry's Tool

This is not entirely surprising. Life cycle assessment has been developed almost exclusively by industry for industry and its primary concern is with identifying those impacts that industry can take action to prevent or reduce without reducing its profitability. Those aspects of the life cycle that can be quantified - the amount of materials used in manufacturing a product, the energy consumed, the wastes generated during production - are thus assessed in minute detail: the broader issues are brushed aside as too amorphous to be amenable to analysis.

Biodiversity issues, for example, were deemed irrelevant to the EU's assessment of the life cycle of tissue paper products. As one study put it:

"Including environmental aspects, other than energy aspects . . . is too variable from location to location to be included in the evaluation of products for ecolabelling purposes."

Conflicts over Claims

As a result, claims made on the basis of life cycle assessments are

making process. Industrial concerns such as Kingfisher, Hoover, Pilkington Shell and Rhône Poulenc which have personnel on the UK Board — although these personnel act in a "personal capacity" have an indirect, if not direct, stake in most of the product categories for which they determine qualifying criteria.

The influence of industry over ecolabelling schemes is clearly reflected in the labels issued. In theory, ecolabelling is meant to assess the environmental impacts of a product through its entire life cycle from "cradle to grave" (*see* Box above). In practice, the impacts considered — and the criteria used to assess such impacts — are limited to those which industry finds least onerous to address.

Compromises between environmental protection and the demands of industry are readily apparent. For example, the EU ecolabelling scheme's criteria for washing machines focus mainly on how much energy the washing machine consumes when it is being used: the impacts of extracting the raw materials to make the frequently disputed. The pharmaceutical giant Proctor & Gamble, for instance, has been criticized for its claim that disposable nappies are no more harmful to the environment than re-usable cloth nappies. According to the company, life cycle assessment revealed that:

"Neither of the two types of nappy shows significant advantages after consideration of all the environmental aspects like raw material needs, solid waste, waste water, air emissions and energy demand."

The Women's Environmental Network (WEN) commissioned an independent review of the studies cited by Proctor & Gamble. The review criticized the studies for failing to consider fully the environmental impacts associated with the packaging and transportation of nappies.

It also argued that different assumptions about the number of times re-usable nappies are used, and the way in which they are laundered, would significantly affect assessments as to the amount of energy and water consumed. The review concluded:

"It is in fact more likely that the use of disposable nappies entails heavier environmental burdens than do cloth nappies."

washing machine and the manufacturing process itself are entirely ignored.⁹ As the British lobby group Women's Environmental Network comments:

"While the use of the machine clearly has the most impact in terms of energy, water and detergent loss, the mining of the metals used and its subsequent effect on the environment have not been monitored."¹⁰

The EU scheme, moreover, addresses the environmental impact of disposal of old machines only by requiring manufacturers to give "encouragement" to the recycling of old machines.¹¹

In the case of the EU ecolabelling criteria for kitchen and toilet paper, the proposed limit on the amount of adsorbable, organically-bound halogens (AOX) in bleach-plant effluent was raised, following industry lobbying. Likewise, the proposed criterion for sustainable forest management for tissue paper made from fresh, unused fibre was relaxed because of industry pressure. Industry lobbying

Tissue Paper Ecolabels

The manufacture and disposal of one-time use disposable products like kitchen paper, paper towels and paper serviettes poses many environmental problems which ecolabelling should address:

- The production of tissue paper from fresh, unused fibre raises issues concerning sustainable forest management and the replacement of biodiverse ecosystems with monoculture tree plantations.
- Currently, much high-quality recycled paper is used for low-grade paper products such as one-time use disposables. Instead, stronger unused and recycled fibres should only be used for high-quality paper grades — for example, for high-quality printing and writing paper. Products which are to be used just once and thrown away, and which are hard to recover for further recycling, should be made only from fibres which have become weak through repeated use.
- The use of chlorine-based chemicals (elemental chlorine, chlorine dioxide and hypochlorite) to bleach pulp has a highly detrimental effect on people and the environment. Hundreds of organochlorine by-products, including highly toxic, persistent and bioaccumulative dioxins and furans, are formed in bleach plant effluents, many ending up in coastal and inland waters. Dioxins are known to suppress the immune systems of organisms exposed to them; cause potentially a range of reproductive disorders; and be carcinogenic. Only a fraction of organochlorine by-products have been assessed for their environmental toxicity. Phasingout chlorine in industrial processes is the most effective way to deal with organochlorines, and the paper industry, among others, should be a focus of concerted regulatory attention.
- The consumption itself of disposable paper products has detrimental environmental impacts. Discarded paper products account for 35-40 per cent of household waste volume.

The criteria that four schemes — Blue Angel (Germany), Green Seal (US), Nordic Council and the EU scheme — have set for a tissue paper ecolabel address these issues to varying degrees.

Sustainable Forestry and Recycling

The Blue Angel scheme disallows the use of fresh, unused fibre and stipulates which grades of used fibres may and may not be used.

Green Seal specifies that recycled fibre only is to be used in the manufacture of paper towels and serviettes (that is, no fresh, unused fibre) — but states that only 40 per cent has to be post-consumer waste. Since manufacturers are unlikely to recycle more than they have to, the remaining 60 per cent of the fibre is unlikely to be "recycled".

The Nordic Council's criteria stipulate that 90 per cent of the fibre needs be recycled, but does not require manufacturers to ensure that the remaining 10 per cent unused fibre comes from sustainably managed forests.

The EU scheme allows for the use of unused fibre; the forestry management principles which it specifies for the forests or plantations providing the unused fibre are, however, very weak. It is difficult, if not impossible, however, to determine precisely what standards and criteria the complex EU scheme does actually set.

Chlorine Bleaching

The use of all halogenated bleaching chemicals, which includes all chlorine compounds, are disallowed by the Blue Angel scheme. The Nordic Council's criterion forbids chlorinaceous bleaching chemicals. But the EU and Green Seal schemes rejects such a precautionary approach to the organochlorine problem, by setting limits on discharges of adsorbable organically-bound halogens (AOX) in effluent.

Overconsumption of Disposable Products

All schemes compare products within a narrowly-defined product category. A broader category which included reusable cloth alternatives would be more likely to encourage consumers to switch to re-usable varieties, and thus promote reduced consumption of disposable paper products.

has also resulted in less stringent compliance testing measures.¹²

One result of such weak standards is that by the time they are published, most manufacturers can comply with them. In the case of the EU washing machine ecolabel standard, all German manufacturers were able to meet the labelling criteria from the beginning. Tentative estimates suggest that the same is true of Danish tissue paper manufacturers for the EU tissue paper ecolabel standards, whilst in The Netherlands 60 per cent of the tissue paper produced could meet the standards without changes to manufacturing practices.¹³

When so many products qualify for labels so soon after criteria are developed, ecolabelling's role in improving environmental standards and reducing negative impacts associated with manufacturing is minimal. Such concerns have already led one member of the UK labelling Board — Tessa Robertson of Greenpeace — to resign, accusing the Board of being more concerned with getting criteria approved and ecolabelled products on the market than with ensuring tough environmental standards.¹⁴

Narrow Categories

Just as industry has limited the criteria for assessing products, so it has actively sought to narrow and manipulate the categories of products which are assessed, insisting that products in a given category

should be "functionally equivalent".15 In the case of light bulbs, for example, European light bulb manufacturers have fought hard to keep compact fluorescent light bulbs from being lumped into the same ecolabelling category as standard incandescent light bulbs --- on the grounds that they do not perform the same functions. Compact fluorescent light bulbs (CFLs) are estimated to be six times as energy efficient as standard incandescent bulbs,16 yet standard incandescent bulbs account for over 90 per cent of the European market. Creating two separate product categories, one for CFLs and one for incandescent bulbs, resulting in two ecolabels, prevents consumers from comparing products and from making a broader environmental choice.

Edwin Maynard/The Environmental Picture Library

What is true for light bulbs is true for many other products. As a result, product groups selected for ecolabelling tend to be narrowly-defined, homogenous groups cars with catalytic converters, washing machines, CFC-free fridges, kitchen paper with a high percentage of recycled fibre and relatively energy efficient light bulbs which, though expedient for industry and administratively convenient for ecolabelling boards, make little sense from an environmental point of view.

White goods discarded on an amenity tip. The EU ecolabel for washing machines does not set firm criteria for disposal of old machines, but merely requires the manufacturer to encourage recycling. In addition, an ecolabel invites consumers to choose between one machine and another, but does not encourage a switch to community-based laundry services.

Instead of encouraging consumers to reassess their lifestyles and patterns of consumption, ecolabels simply invite them to chose between existing products. The choice presented is between one washing machine and another, between one car and another: the option of making more radical choices - of switching to community-based laundry services or using public transport, for example - is not offered. Ecolabels may encourage consumers to buy recycled, non-chlorine bleached kitchen paper in preference to non-recycled, chlorine bleached kitchen paper, but they give no indication that all kitchen papers, however they are manufactured, are less environmentally friendly than reusable cloths. Similarly, for those able to do so, taking the bus or train is a better environmental choice than driving a car, with or without a catalytic converter. Indeed, even if all car owners switched to cars with catalytic converters as a result of an ecolabel, there would be no net gain for the environment if private car ownership itself increased.

An Effective Veto

Even where ecolabelling schemes have set a point beyond which they will not lower environmental standards, the voluntary nature of ecolabelling gives industry an effective veto over the schemes. In Germany, for example, the Blue Angel scheme has issued labelling criteria, generally of a relatively high standard (compared with the EU scheme or the private US Green Seal scheme), for some 75 product categories, with over 3,500 single products labelled by 873 companies. However, in 1991, some 13 years after the establishment of the scheme, over half of the total labels awarded were in just four product categories.17 In many product categories, market forces have simply failed to have any effect on consumers or producers.18 In over half the product categories, fewer than 10 labels had been awarded.19 This is in a country where there is a high awareness of environmental issues on the part of consumers and industry - and where conditions should thus be conducive to a successful ecolabelling scheme.

If manufacturers are unhappy with the labelling criteria, all they have to do is refuse to participate and the scheme loses its purpose - especially where producers act in concert to defend their common interests. In some cases, manufacturers have deliberately undermined ecolabelling initiatives through boycotts. In 1992, for instance, the Nordic Council (which administers a scheme covering Iceland, Sweden, Norway and Finland) published criteria for a kitchen and toilet paper ecolabel which set a limit on the amount of fresh, non-recycled fibre to be used and did not allow the use of chlorine-based chemicals for bleaching tissue pulp. In response, the main European tissue paper manufacturers, under the aegis of the European Tissue Symposium, withdrew from the Nordic ecolabelling scheme.20 It is likely that they will also boycott the EU's tissue paper label, even though lobbying by tissue manufacturers has already ensured that the criteria are less stringent than those of the Nordic Council.

The European Lighting Companies Federation, which represents Europe's main light bulb manufacturers, have similarly stated that they will not participate in any ecolabelling schemes whose criteria address anything wider than energy efficiency, such as packaging or the use of hazardous substances like mercury.²¹

Ecolabelling and Free Trade

Because of its voluntary rather than mandatory nature, ecolabelling has fitted well with the deregulatory climate of the 1990s and with the "sustainable development" discourse of protecting the environment through market-led instruments — one reason why it has proved so attractive to industry.²² The types of ecolabels available in practice offer manufacturers incentives to maintain their market share or sell more products while enabling them to appear to be improving the environmental profile of products and processes.

But some governments and official bodies are now preoccupied with the possibility that even voluntary ecolabelling violates free trade rules.²³ The European Commission has been asked by member states to look into the compatibility of ecolabelling with the section of the new General Agreement on Tariffs and Trade (GATT) on Technical Barriers to Trade (TBT) which covers product standards.²⁴ The GATT alarm over ecolabelling was originally raised by Brazil in 1993 when it expressed concern over the EU's proposed criteria for tissue paper products. Brazilian pulp manufacturers complained that the criteria governing the consumption of renewable and non-renewable resources, waste generation and sulphur emissions would disadvantage foreign producers who could not meet these criteria.²⁵

The United Nations Conference on Trade and Development (UNCTAD) has since raised a number of other general concerns, pointing to the general lack of transparency in the decision-making process of Northern ecolabelling schemes, the predominance of local and multinational commercial interests and the exclusion of developing country interests.²⁶ The fact that manufacturers will have to adapt exported products to a variety of standards set by different ecolabelling schemes is also cited as a possible barrier to developing country exports.²⁷

A number of proposals for dealing with these problems are being considered, such as widening representation on ecolabelling committees to include developing country interests, creating a system of mutual recognition of national ecolabelling schemes, standardizing principles and procedures for ecolabelling, and drawing up a global ecolabel. If previous moves to harmonize standards to suit free trade rules are anything to go by, however, ecolabelling schemes are likely to be harmonized towards the lowest standard rather than the highest.²⁸

Conclusions

If citizens as consumers are to play any part in halting environmental decline, it will be through radical changes in lifestyles and patterns of consumption, orientated towards local produce. maximization of product life, re-use and recycling and energy conservation, not through buying ecolabelled products. At best, ecolabelling is a means of bringing about small incremental changes in product and production environmental standards which address a narrow definition of environmental impacts, based mainly on physical and material inputs and outputs. At worst, it is nothing more than a marketing gimmick. Unless environmental criteria for products are truly objective and participation in ecolabelling schemes mandatory, it is difficult to see how this will ever change.

Notes and References

- For example, the UK Advertising Standards Authority (ASA) upheld a complaint against the Vauxhall car manufacturer about its claim that one of its models was "the greenest car in its class". Although the car had the lowest fuel emissions in its class, it was only fifth in terms of fuel consumption. The ASA also ruled against the hamburger chain McDonalds for claiming that the polystyrene in its packaging was "fully recyclable" when the company itself did not recycle it. See: "Firms fail to heed ASA advice on absolute 'green' claims", ENDS Report, September 1993; and "ASA's Second Ruling on Polystyrene vs. Paper", ENDS Report, December 1992.
- 2. Commission of the European Communities, Towards Sustainability, Fifth Action Programme on the Environment, Brussels, 1992. The Commission comments: "Up to now, [European] Community action programmes on the environment have largely been based on legislation and controls involving government and manufacturing industry. The concept of shared responsibility requires a much more broadly-based and active involvement of all economic players including public authorities, public and private enterprise in all its forms, and, above all, the general public, both as citizens and consumers" (p.57).
- 3. Government initiatives have instead regulated manufacturers' claims through legislation that strictly defines terms like "recyclable", "biodegradable" and "ozone safe". As of May 1994, 15 cases of products in breach of the definitions had been heard by the Federal Trade Commission. In Europe, no such legallyenforceable definitions exist in consumer law.
- International Standards Organization/International Electrotechnical Committee, Report of the Fourth Meeting of the ISO/IEC Strategic Advisory Group on Environment (SAGE), Toronto, June 1993.
- Organization for Economic Cooperation and Development, *Environmental Labelling in OECD Countries*, OECD, Paris, 1991. See also Organization for Economic Cooperation and Development, *Workshop on Life-Cycle Management*, OECD, Paris, 20-21 July 1993.
- Implicit in the European Commission's 1992 Fifth Action Programme on the Environment, for example, is the concept that voluntary instruments should take over some of the function of legislation. See Commission of the European Communities, op. cit. 2.
- Commission of the European Communities, "Council Regulation (EEC) No. 880/92 of 23 March 1992 on a Community Eco-Label Award Scheme", Official Journal of the European Communities, 1992, p.4.
- In fact, the Blue Angel scheme has been criticized for not giving enough ground to industry.
- Khoroushi, S. and Vallely, B., *Ecolabelling and* Washing Machines — Problems with Environmental Criteria, Women's Environment Network, 1993.
 Ibid.
- 11. EU criteria for washing machines fall into three categories: key criteria, which are firm standards on energy and water consumption which manufacturers must meet; performance criteria to ensure that there is no diminution of product quality; and best practice criteria which stipulate that manufacturers must give information, for example, on recyclability or appropriate wash temperatures. For recycling, there are only best practice criteria. Manufacturers are required to provide information that the machine is made of recyclable materials which should be disposed of

accordingly; give "encouragement" to recycling; and permanently mark components heavier than 50 mg which are made with polymeric materials.

- 12. These observations were made to the author during discussions with Brussels participants in, and observers of, the deliberations on the kitchen and toilet paper ecolabels.
- Jaakko Poyry, Western European Tissue Paper Markets and the Eco-Labelling Potential of Toilet Tissue and Kitchen Rolls, Danish Environmental Protection Agency, 1994.
- 14. Robertson, T., personal communication.
 15. Summarizing attitudes to the assessment of lightbulb categories, a study commissioned for the UK Ecolabelling Board notes: "a meaningful comparison of the environmental performance of two products can only be drawn if the products perform the same function or satisfy similar needs." See Environmental Resources Ltd., Ecolabelling Criteria for Lightbulbs, Report for UK Ecolabelling Board, London, February 1993. In addition to being functionally equivalent, a
- further requirement is that goods be "competitive in the eyes of the consumer". See Organization for Economic Cooperation and Development, Environmental Labelling in OECD Countries, op. cit. 5.
- 16. Environmental Resources Ltd., op. cit. 5.
- Organization for Economic Cooperation and Development, *Environmental Labelling in* OECD Countries, op. cit. 5.
 Ibid.
- Salzman, J., *The Trade Implications of Ecolabelling*, Paper delivered to OECD Workshop on Life Cycle Management and Trade, OECD, Paris, 20-21 July 1993.
- Swedish Standards Institution, "Environmental Labelling", fax, 6 June 1994.
- European Lighting Companies Federation, Environmental Labelling of Lamps — Logo Pollution, Brussels.
- 22. The International Chamber of Commerce (ICC) states: "Making market forces work in this way to protect and improve the quality of the environment with the help of performance-based standards and judicious use of economic instruments in a harmonious regulatory framework is one of the greatest challenges that the world faces in the next decade." See International Chamber of Commerce, Business Charter for Sustainable Development Principles for Environmental Management, London, undated.
- 23. It is surprising that voluntary ecolabelling schemes should have come under free trade scrutiny at all. Ecolabelling schemes are not official standard-setting bodies and would not normally be expected to comply with free trade rules. Mandatory ecolabelling schemes such as the Dutch government's proposal to label imported timber have effectively been outlawed by GATT. Current concern about the trade implications of voluntary ecolabelling schemes seems to be about the degree of government involvement in their execution and funding.
- "Question Mark over Future of EC Ecolabelling Scheme", ENDS Report, October 1994.
- 25. Jha, V. and Zarrilli, S., Ecolabelling Initiatives as Potential Barriers to Trade — A Viewpoint from Developing Countries, Paper delivered to OECD Workshop on Life Cycle Management and Trade, OECD, Paris, 20-21 July 1993.
- UNCTAD Secretariat, International Cooperation on Ecolabelling and Ecocertification Programmes, Paper to the Ad Hoc Working Group on Trade, Environment and Development, UNCTAD, Geneva, November 1994.
 Ibid.
- 28. See, for example, Avery, N., Drake, M. and
- Lang, T., "Codex Alimentarius: Who Is Allowed In? Who Is Left Out?", *The Ecologist*, Vol 23, No 3, May/June 1993.

Townspeople in 1630 fled to the countryside, hoping to escape the plague, one of the diseases that scientists in the 1970s predicted would soon be a thing of the past.

New and Resurgent Diseases The Failure of Attempted Eradication

by

The Harvard Working Group on New and Resurgent Diseases

Official predictions that modern medicine would eradicate infectious diseases have proved to be spectacularly misplaced. Diseases, such as malaria, tuberculosis, measles and hepatitis, are still a major cause of death in many parts of the world. New diseases continue to emerge at unprecedented rates while known ones return to regions where they were on the decline. In many cases, changes in the environment are creating new pathways for diseases to spread and take hold.

It is barely 25 years since W. H. Stewart, then Surgeon General of the United States, told the US Congress that "the time has come to close the book on infectious disease."1 With tuberculosis, polio and other killer infections on the decline throughout the industrialized world, Stewart and many other public health officials were confident that, thanks to improved hygiene and the development of new drugs and vaccines, the "war" against infectious disease was all but won - at least in the West. As one prominent biologist, John Cairns, would write in 1975, "During the last 150 years, the Western world has virtually eliminated

Members of the Harvard Working Group on New and Resurgent Diseases have been working together since 1991; they are **Richard Levins** is an ecologist; **Tamara Awerbuch** is a biomathematician; **Uwe Brinkmann** was an international health epidemiologist; **Irina Eckardt** is a philosopher of science; **Paul Epstein** is a medical practioner; **Tim Ford** is an environmental microbiologist; **Najwa Makhou** death due to infectious disease."2

At the time, such a claim did not seem wholly unjustified. Within a decade of Stewart's testimony to Congress, the World Health Organization (WHO) officially announced the worldwide "eradication" of smallpox after a 20-year long vaccination campaign.³ WHO forecast that this triumph of medical science and bureaucratic management would soon be repeated for six target diseases — diphtheria, measles, whooping cough, tetanus, tuberculosis (TB) and polio through its Expanded Programme on Immunization.⁴

The medical establishment was un-

daunted by evidence that many of the agents of infectious diseases were rapidly developing resistance to the drugs and chemicals — the mainstay of the eradication campaigns — that had previously killed them. It was also unimpressed by research that revealed the remarkable ability of bacteria, insects and other agents of disease to survive apparent elimination. It was therefore dismissive of those who questioned its unbridled optimism or its goal of eradicating the pathogenic causes of disease. What had been done for one disease could, it was assumed, be done for others.⁵

Success Turns Sour

Yet today infectious diseases remain the leading causes of death in the world, killing more people than heart disease or cancer,⁶ while the incidence and spread of these infections, which had been deemed to be

is a sociologist of science; Christina Albuquerque de Possas is a social scientist; Charles Puccia is a systems ecologist; Andrew Spielman is a public health entomologist and Mary E. Wilson is a clinical infectious-disease specialist. In 1994, the New York Academy of Sciences published their book, *Diseases in* Evolution: Global Changes and Emergence of Infectious Diseases, edited by M E Wilson, R Levins and A Spielman.

"under control", is increasing.

In the US, the incidence of tuberculosis (TB), which had been declining steadily since 1882,⁷ rose by 18 per cent between 1985 and 1992, with 26,687 cases reported in 1992.⁸ In New York City, "the climb has been even steeper, with an increase of nearly 150 per cent since 1980."⁹ In Europe, TB has returned with a vengeance: Italy reported a 28 per cent increase in cases between 1988-1990, whilst Switzerland experienced a 33 per cent rise from 1986-1990.¹⁰

In 1991, eight million new TB cases were reported worldwide, and one-third of the world's population is now estimated to be carrying the infection. While the infection is dormant in most of these people, the spread of the human immunodeficiency virus (HIV), which destroys the immune cells that keep the TB bacterium under control in the body, is expected to cause many of them to succumb to the disease. With several strains of the bacterium now resistant to all anti-TB drugs,¹¹ WHO admits that the disease "is out of control in many parts of the world."¹²

Diphtheria has reemerged as a major killer of adults in the former Soviet Union, the number of cases more than doubling between 1985 and 1992 in Russia

alone.¹³ Plague has resurfaced in India, while malaria has returned to regions from which it had supposedly been eliminated and is spreading to previously unaffected areas. Cholera, for the first time in almost a century, has reemerged as a major killer in Latin America.

Epidemics of dengue fever, a viral infection transmitted primarily by the Aedes aegypti mosquito, have swept Venezuela, Brazil, India and Australia for the first time ever. WHO warns that dengue "is spreading . . . throughout the globe, affecting tens of millions [of people] annually."14 Cases of the more severe forms of the disease. dengue haemorrhagic fever and dengue shock syndrome, are skyrocketing: between 1986-1990, an annual average of 267,692 cases were reported, as compared with an average of 29,803 cases in previous years.15 Yellow fever, too, is on the increase, the number of cases in

Africa alone soaring from a few hundred a year in the late 1940s to an estimated 200,000 today.¹⁶

In addition, the last two decades have seen humans succumb to a range of previously unrecorded (but probably long present) diseases. First came Lyme disease (1975), hantavirus pulmonary syndrome (1977), then Legionnaire's disease (1978), toxic shock syndrome (1978) and, more recently, AIDS (1981) and Ehrlichiosis (1989).

Suddenly, the euphoric proclamations of freedom from infection seem, at best, premature; at worst, dangerously hubristic.

Disease Turnover

Few scientists now predict the total elimination of infectious disease, maintaining instead that the pattern of infection will be one of "disease turnover". Within mainstream science, medical practitioners generally hold that mutations in viruses and other microbes are responsible for such turnover — new diseases emerging as evolutionary pressures cause pathogens to move from animals to humans, or to convert from innocuous forms into lethal ones.¹⁷

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A growing number of researchers, doctors and public health officials, however, are beginning to question this view. Many viruses do indeed show high mutation rates; and viral variation *per se* undoubtedly plays a role in causing some diseases to persist — influenza, for example.¹⁸ But focusing solely on the evolution of pathogens is to overlook that the genetic makeup of pathogens — whether microorganisms, such as bacteria or viruses, or larger organisms, such as protozoa, fungi and worms — is only one of many factors that contribute to the emergence of disease.

The way in which these pathogens spread from host to host is one of these factors. To facilitate such a spread, many pathogens require an accomplice, called a vector, which is often an insect. The insect bites an animal infected with the pathogen and ingests some of its blood. When the insect feeds again, it deposits in that subsequent host's tissues pathogens derived from the first host.

Certain "reservoir hosts" may also be required for perpetuating the pathogen. Rodents, for instance, may harbour a microbe without apparent symptoms, while also supporting the fleas, ticks or other ectoparasites that serve as the vehicle for transmission. The degree of contact between reservoir, vector and pathogen

> largely determines the prevalence of infection. Whether or not a potential host succumbs to the disease, however, depends on its general state of health and nutrition, as well as its genetic disposition.

Pathways for Disease

In fact, virtually all pathogens that are regarded as "new" previously existed in nature. Their emergence as "new" agents of disease has generally resulted not from the pathogens changing but from social conditions and environmental changes that have enabled the pathogens to gain access to new host populations, or to become more virulent in immunocompromized hosts. Marburg and yellow fever viruses, for example, originally were infections of monkeys; Rift Valley fever was an inherited infection of mosquitoes; and hanta virus was maintained in rodent

The Dialectic of Disease

Neither pathogens nor their vectors are static entities, fixed by nature; nor is their relationship to their environment a passive one. Organisms undergo natural selection both within the host and in the course of transmission between hosts. A pathogen's success in adapting to conditions within and between hosts will determine, in part, its success in spreading throughout a population.

A pathogen is confronted with three, sometimes conflicting, demands. It must obtain nourishment to develop and reproduce, avoid being killed by the body's defences, and find a satisfactory exit to another host. Meeting these demands may require that a pathogen localize to a particular site in the body. For example, the blood is an optimal site for feeding, but it is a site of high immune activity. A pathogen in the central nervous system is relatively secure from destruction by the immune system but has no easy exit. The skin is also relatively safe from the immune system and can be exited fairly easily, but it is not a good site for reproduction.

Some pathogens adopt strategies for dealing with the immune system, so they are freer to choose sites in the body where immune activity is high. The human immunodeficiency virus, which causes AIDS, can remain in the blood because it destroys part of the immune system. Trypanosomes, which cause sleeping sickness, can also remain in the blood because they are adept at changing their protein coat to dodge detection by the immune system.

From the point of view of the pathogen, the symptoms suffered by the host are merely by-products of the pathogen's life style. For example, in diarrhoeal diseases, the most obvious symptom arises when the pathogen exits its host in search of another. The pathogens remaining in the original host invade the gastrointestinal mucosa so they are not whisked away during the diarrhoeic episode.

Pathogens face other strategic decisions as well. Should they reproduce rapidly and exit quickly or should they prolong the infection in the face of uncertain success in infecting someone else? The strategy adopted will depend on the relative rates of pathogenic reproduction, contagion possibilities and the danger of strong and effective treatment of the infection.

The role of drugs — antibiotics and antivirals in particular — in directing natural selection in the pathogen makes the intervener a part of the system being intervened in. The host's behaviour in effect becomes part of the selection pressure and affects the characteristics of the pathogen in the next outbreak. For example, if the host uses antibiotics, some of the pathogens may develop resistance to the drugs. During future outbreaks, these drug-resistant pathogens may predominate, and other antibiotics will have to be used to eliminate them. Worldwide misuse of antibiotics has resulted in multiple drug-resistant pathogens that are, with current technology, essentially untreatable.

Vectors, like pathogens, also undergo evolutionary change. Currently, a new biotype (or possibly sibling species) of the whitefly *Bemisia tabaci*, carrier of bean golden mosaic virus, is spreading at the expense of the previous biotype. The new biotype has a wider range of host plants to feed on and is therefore spreading viruses to new plant species. In this case, a change in host range of the vector makes new species of plants serve as reservoirs for infections of crop plants. Reservoirs can maintain pathogens at low levels in wild populations without being noticed, until a change in the environment or vector opens up new opportunities.

populations.¹⁹ These pathogens transferred to humans because human activity created the opportunity for them to do so.

In the case of yellow fever, humans serve as hosts for the pathogen mainly when forests are being cleared, bringing people into contact with the mosquitoes that normally live in the canopy along with the monkey reservoir. Humans represent a literal "dead end host" for this pathogen, since each epidemic rapidly exhausts the reservoir of potential susceptible hosts.

The complex interaction of events that can result in the emergence of a new disease is well illustrated by Oropouche fever, a non-fatal disease which causes severe headaches, muscle pains and occasionally meningitis.²⁰ Frequent epidemics of the disease have occurred in Brazil in which hundreds of thousands of people have been affected. The first outbreaks followed the building of a highway in the early 1950s from Belem on the coast to the capital, Brasilia, in Amazonia. Soon after construction of the highway, researchers isolated the Oropouche virus in the blood of highway workers and discovered that it was the same as that found in the blood of a sloth on the side of the Belem-Brasilia highway. Writer Ann Gibbons records that the connection between the virus, the sloth and the epidemic took 19 years of epidemiological detective work:

"At the time, the virus was not known to be responsible for epidemics in humans or animals, but by 1961 it had spread to Belem, causing a 'flulike epidemic in 11,000 people. While it was clear that Oropouche was to blame for the epidemic, it was not clear how a virus never seen in human beings before had leaped from the jungle fauna to the residents of Belem . . . By 1980 researchers had the answer: in that year, they isolated the virus from biting midges (Culicoides paraensis), which proved to be the missing link. The forestdwelling midges, it seems, had gone through a population explosion when the settlers started clearing the forest

and planting cacao for chocolate. After the farmers harvested their cacao beans, they discarded the hulls in piles that were an ideal breeding ground for the midge which spread the virus to humans along the Amazon roads."²¹

Viewed from this perspective, the aetiology of Brazil's Oropouche epidemics cannot be reduced to a single cause. Rather they resulted from a complex dialectic between a pathogen and its environment, where human activity - the colonization of the Amazon region, the cultivation of cacao, and subsequent environmental changes that encouraged the proliferation of Culicoides and their interaction with humans²² - created the opportunity for Oropouche to become a disease in humans. Attempts to "explain" Oropouche through a narrow focus on viral evolution are thus highly misleading, not least because they render invisible the role that specific economic and social forces played in creating the disease.

What is true for Oropouche is true for numerous other diseases. Most bacteria are not pathogens, most arthropods are not disease vectors, and most mammals are not a source of human disease. If they emerge as agents of disease, it is more often than not because of environmental change, which today results primarily from human activity. In continent after continent, country after country, both old and modern technologies and ways of living have created new niches for pathogens. As economies become increasingly international, environments degraded and growing sections of society impoverished, the pace of this change increases.

Pathogens on the Move

Increased travel and trade have greatly increased the opportunities for pathogens and vectors to spread to new areas. The problem is not a new one — yellow fever and its principal vector, the *Aedes aegypti* mosquito, probably spread-from Africa to the Americas via the slave trade — but the rapidity with which goods and people now move around the globe has augmented the likelihood of "microbial traffic".

One reason is that modern transportation has cut travel time to almost anywhere in the world to a few days at most, less than the average incubation period of many pathogens. Travel time, therefore, presents a less significant barrier to the spread of disease than it once did. In Christopher Columbus's time, for example, crossing the Atlantic Ocean was slow compared to the progression of, say, smallpox. Since all carriers of the smallpox virus manifest symptoms of the disease, most infected travellers would have either become sick and died or recovered before they reached the New World. As a result, smallpox did not reach the Americas until several decades after Columbus's voyage. Today, travellers routinely arrive home with diseases they have "picked up" abroad: in the US, virtually all of the 1,173 cases of malaria reported in 1991 were contracted overseas.22

The concern, however, is not simply with sporadic cases of travellers being struck down with tropical illnesses. The large-scale movement of goods and people around the globe increases the probability of vectors (often insects) and nonhuman carriers of disease being introduced into areas where neither previously existed — frequently with fatal results. The reintroduction of cholera to South America in the 1990s, for example,

Complexity is the hallmark of disease

is thought to have resulted from a freighter discharging ballast water from China into Peruvian coastal waters. The water carried the cholera vibrio which flourished in algal blooms enriched with nitrogen and phosphorous from sewage and fertilizers. Algae are filtered and eaten by molluscs, crustaceans and fish that are, in turn, eaten by people. Once it entered Latin America, the infection spread rapidly, encouraged by rapid urbanization and IMF- and World Bank-imposed cut backs in sanitation and public health programmes. As of December 1994, millions of Latin Americans had become ill while thousands had died. Numbers can only be estimated, as reported cases are thought to be only a fraction of those infected.

Likewise, though as yet with less drastic consequences, the Asian tiger mosquito, a potential vector for dengue fever, was recently introduced into the US in a shipment of rubber vehicle tyres imported from Asia. The mosquito is now established in at least 18 states in the US. It has similarly been introduced to Brazil and parts of Africa through the trade in tyres.²⁴

Current development policies have also contributed considerably to the spread of disease by undermining local livelihoods and forcing people to migrate in search of work. The resurgence of malaria, for example, has been greatly exacerbated not only by the building of irrigation schemes, creating drainage problems that increase the opportunities for vector mosquitoes to breed, but also by migrant workers bringing the pathogen into areas where it previously did not exist. Non-immune migrants entering endemic areas may fuel another kind of outbreak. Political and economic oppression has exacerbated the problem, as more and more people are forced to move both within countries and between them. The net effect is that diseases once limited to small regions of the globe are no longer confined.

The increase in yellow fever has generated the fear that in Africa the disease will be carried from savannah areas and forest fringes, where it is currently confined, to the continent's major cities, where the mosquito vector is plentiful but the virus as yet absent. Migration of people from rural to urban areas, spurred

by current development policies, could bring the virus to the vector, risking an urban epidemic. Similarly, in Latin America, public health officials fear that the stage is set for a major outbreak of vellow fever: as in Africa, the risk is that urban mosquitoes will pick up the virus from rural migrants seeking work in the cities. Air travel could then spread the disease still further afield to countries such as the US, where the mosquito vector is now firmly established in the southeast of the country. According to the US Institute of Medicine, a future yellow fever outbreak in New Orleans alone could cause 10,000 to die within 90 days, and 100,000 to become ill.25 Jim LeDuc, a competent virologist and epidemiologist working for WHO, warns of the spread of yellow fever that "we could be in for a major worldwide catastrophe."26

Changing Ecosystems

The emergence of new diseases has been greatly assisted by environmental degradation. Importation into a new location does not ensure that a pathogen will take hold there. In fact, most introductions do not result in colonization because the species does not find a hospitable niche and dies. To colonize new terrain, the intruding pathogen must find a suitable environment and a receptive host population.

In general, colonization is easiest in regions of low biological diversity, where the intruder faces less competition from native species. Oceanic islands are notoriously vulnerable to colonization; they have been devastated by colonizations of rats, goats or weeds because the few native species could not compete. Also vulnerable are habitats that have been disturbed by natural events or human activity, because these events eliminate predators and competitors and create opportunities for new species to take up residence.

For example, the spread in much of the northeastern United States of Lyme disease, which causes symptoms ranging from a distinctive rash to meningitis and severe rheumatoid arthritis, is related to several human activities that have dramatically altered the region's ecology. Forest clearance during previous centuries to make way for agriculture eliminated deer and their predators from the area. The forests eventually returned during the 1900s, as did the deer — but not the deer's predators. The deer tick, carrier of the Lyme disease infection, was

able to spread unimpeded throughout the deer population. At the same time, many more homes were built in forested sites, leading to greater numbers of people being bitten by infected ticks which had acquired their infection from local rodents27 - and Lyme disease emerged as a major epidemic. The disease is now the most common vector-borne disease in the US with all 50 states now affected and over 40,000 cases reported to the US Centres for Disease Control since 1982.28

Infrastructure development, poverty and pollution have also combined to create new niches for diseases. Sewage and fertilizer pouring into marine ecosystems, the overharvesting of fish and shellfish and the loss of wetlands, combined with climatic changes, have conspired to cause massive algal blooms in coastal areas worldwide, providing a rich environment for diverse communities of microorganisms. The sea-surface temperatures in these environments are frequently high, encouraging a shift towards more toxic forms of pathogens, possibly by increasing their rates of mutation and reproduction. Among the new species that have been

identified in these algal blooms is a new variant of the cholera vibrio called *V*. *Cholerae 0139*. Antibodies that recognize other known variants of cholera do not recognize this new variant, which is now present in 10 Asian nations. Many fear that this environmentally-hardy, new form of the disease could easily become the agent of a worldwide cholera pandemic.²⁹

On land, piles of used rubber tyres around the edges of rapidly growing cities collect water in which the mosquito *Aedes aegypti*, a vector for dengue fever and yellow fever, reproduces. Irrigation ditches, borrow pits, construction sites, poorly-drained water pumps and puddled river bottoms may all serve as breeding sites for the mosquitoes that carry malaria. The pathogens carried by the mosquitoes can feed in these new habitats without being diverted to other animals, who are less successful in shuttling the pathogen to human hosts. In this manner,

A pensioner living in condemned private housing in Coventry. The rising incidence of TB in Britain, especially in some deprived inner city areas, has been attributed in part to an increase in the disease's traditional allies: poor housing, overcrowding and malnutrition.

whole new niches have been created beyond the original geographic and ecological range of the vectors.

Moreover, as the environment of affluent areas becomes increasingly "engineered" — through, for example, the impoundment, treatment and distribution of water, and the design of closed buildings in which air recirculates — organisms which can survive in disinfected and "hygienic" environments prosper. Legionnaire's disease, cryptosporidiosis (400,000 infected in Milwaukee, US, in March 1993), "sick building syndrome" and other microbacterial infections are the result. Likewise, prisons and hospitals have been sites for the transmission of tuberculosis.

Climate Change

In addition, there is now widespread concern about the potential effects of climate change on disease. Changes in global temperatures would carry with them changes in wind and precipitation patterns, ocean currents, humidity, soil composition and vegetation. All of these affect human activity and movements of people, as well as redistributing vectors and creating new breeding sites for disease. In Zimbabwe and western Mozambique, periods of drought, associated with the El Niño effect, have regularly led to major infestations of rats. which serve as carriers for a number of pathogens.30 In India and Colombia, a warmer climate is believed to be responsible for Aedes aegypti mosquitoes, associated with both dengue and yellow fever, being found above 2,000 metres: previously they were limited by temperature to altitudes below 1,000 metres.

Climatic disruption in the form of floods and drought may also trigger new diseases. In late 1993, for example, a mysterious illness emerged in the "Four Corners" region of the southwestern United States. A 37-year old farmer who worked in the area sought medical help when an illness he had had for six days took a turn for the worse. At first, the farmer experienced 'flu-like symptoms,

including fever, nausea and vomiting, which progressed to coughing and shortness of breath. An X-ray showed fluid in both of the farmer's lungs. After 12 hours, he developed acute respiratory distress and died. Several weeks and several cases later, scientists at the Centres for Disease Control in Atlanta linked the mysterious disease to a new strain of hantavirus, one of a group of viruses that have been associated with hemorrhagic fevers and kidney disease in Europe and Asia, but that had not previously been known to cause disease in North America. Studies at the University of New Mexico have linked the emergence of the disease to a sudden increase in deer-mice, which are carriers of the hantavirus, following the end of a six year drought in the spring of 1992. Heavy rains deluged the area, producing an abundance of piñon nuts and grasshoppers - food for mice. Deer-mice flourished, but the drought had virtually eliminated all of their predators. Between May 1992 and May 1993, the numbers of deer-mice increased ten-fold and did not decline until October 1993, at which point the epidemic came to an end. As of February 1995, 102 cases of hantavirus pulmonary syndrome had been reported in 21 states, mostly clustered in the Southwest: 52 per cent were fatal, the mean age of victims being 35.

Vulnerability

Finally, the spread of a human pathogen requires a vulnerable human population. The vulnerability of a group of people to a pathogen depends not only on how contagious the pathogen is and how quickly it is transmitted from person to person, but also on the population's immunity. In this equation, all social and environmental changes are potentially reflected epidemiologically, since conditions can affect the opposing processes of contagion and recovery, acquisition and loss of immunity.

The degree of contagion, for example, depends on the number of pathogens that leave an infected individual and enter the environment. It also depends on the number that survive in that environment and gain contact to and ultimately infect other people. Each of these steps is complex and combines biological and social factors that are not constant. For example, no two people are equally susceptible to infection. A person's general state of health is as much determined by social, nutritional, age and gender factors as by genetics. Personal habits, such as smoking, sexual practices, alcohol consumption, and food availability and preferences can also contribute to a person's susceptibility to a particular disease, as do social and economic factors.

These factors range from housing conditions to the availability of food and the extent of exposure to pollutants, and are in turn skewed by the differential impacts of class, gender, race and ethnicity. In the US, African American and Native American communities tend to be more exposed to environmental pollutants than more affluent communities. The rise of TB primarily affects poor, inner city communities. Likewise, as current development policies redistribute power, land and other assets in favour of a small minority of the world's population, the increasing poverty of those marginalized by the development process leaves them without adequate nutrition, shelter or access to basic health provisions and thus

more vulnerable to disease.

In addition, ageing populations, the increased numbers of people with damaged immune systems, and the spread of AIDS have provided susceptible hosts for a wide range of infectious diseases that would otherwise be easily repelled by the host's immune system. In a susceptible population, however, the diseases are more likely to reach epidemic proportions.

Confronting Complexity

Disease cannot be understood (let alone countered) in isolation from the social, ecological, epidemiological and evolutionary context in which it emerges and spreads. Indeed, if one lesson has emerged from the spectacular failure of Western medicine to "eradicate" certain diseases, it is that diseases cannot be reduced to a single cause nor explained within the prevailing linear scientific method: complexity is their hallmark. Indeed, such is the network of factors that lead to disease that the conventional classification of diseases into "infectious", "environmental", "psychosomatic", "autoimmune", "genetic" and "degenerative" is probably applicable only to a few diseases where one factor overwhelms all others.

That lesson has still to be learned within many of the most powerful institutions governing health policy. The failure of the World Health Organization to implement successfully its Extended Programme of Immunization (EPI) against its six target diseases has been blamed not on a failure of approach, but on a failure of administration. Now that EPI has been replaced by the Children's Vaccine Initiative (CVI), funded by the Rockefeller Foundation and the World Bank, the WHO is concentrating its efforts on developing new "super-vaccines". It is a perspective on disease that benefits many vested interests, but does little to address the multiple causes of disease. Although aware of such disease complexity, health institutions remain locked into policies and products that contribute to a focus on eradication of specific pathogens, primarily for institutional and economic reasons.31

Notes and References

- Surgeon General W.H. Stewart, cited in Bloom, B.R. and Murray, C. J. L., "Tuberculosis: Commentary on a Reemergent Killer", *Science*, Vol. 257, 21 August 1992, p.1055.
- Cairns, J., Cancer: Science and Society, W.H. Freeman, San Francisco, 1975.
- 3. World Health Organization, The Global

Eradication of Smallpox, Final Report of the Global Commission for the Certification of Smallpox Eradication, WHO, Geneva, 1980.

- 4. "Keep on Taking the Initiatives", *The Economist*, 13 November 1993.
- 5. Ibid.
- 6. Bloom, B.R. and Murray, C.J.L., op. cit. 1.
- Reider, H.L., Cauthen, G.M., Cormstock, G.W., and Snider, D.E., *Epidemiological Review*, Vol. 11, 79, 1989, cited in Bloom, B.R. and Murray, C.J.L., op. cit. 1.
- Brown, P. "The Return of the Big Killer", New Scientist, 10 October 1992, p.30.
 Ibid.
- "WHO attacks Global Neglect of Tuberculosis Crisis", Press Release, WHO, Geneva, 15 November 1993.
- 11. Ibid. A third of TB cases tested in New York in 1992 were resistant to the principal anti-TB drug and almost a fifth were resistant to the two main anti-TB drugs.
- Nakajima, H., "Tuberculosis: A Global Emergency", World Health, No.4, July-August 1993, p.3.
- "Diphtheria in the former Soviet Union: The Epidemic Continues", Press Release, WHO, Geneva, 10 September 1993.
- WHO, quoted in Maurice, J., "Fever in the Urban Jungle", New Scientist, 16 October 1993, p.25.
- Lederberg, J., Shope, R.E. and Oaks, S.C. (eds.), *Emerging Infections: Microbial Threats to Health in the United States*, Institute of Medicine, National Academy Press, Washington DC, 1992, p.50.
- 16. Maurice, J., op. cit. 14, p.26.
- Gibbons, A., "Where are 'new' diseases born?", Science, Vol.261, 6 August 1993.
- Morse, S.S. (ed.), *Emerging Virsuses*, Oxford University Press, Oxford, 1993, p.12.
- 19. Gibbons, A., op. cit. 17.
- Monath, T.P., "Arthropod-borne Viruses" in Morse, S.S., op. cit. 18, p.142.
- 21. Gibbons, A., op. cit 17.
- 22. Monath, T.P., op. cit. 20, p.145.
- R. Epstein, "Global Village Virus", The Geographical, August 1993, p.32.
- Morse, S.S., "Examining the Origins of Emerging Virsuses", in Morse, S.S. (ed.), op. cit. 14, p.19.
- Lederberg, J., Shope, R.E. and Oaks, S.C. (eds.), op. cit. 15, quoted in Maurice, J., op. cit. 16, p.27.
- 26. Ibid, p.25.
- 27. Awerbuch, T.A. and Speilman, A., "Host Density and Tick Dynamics: The Case of the Vector of Lyme Disease", in Perry, B.D. and Hansen, J.W. (eds.), *Modelling Vector-borne and Other Parasitic Diseases*, The International Laboratory for Research on Animal Diseases, Nairobi, Kenya, 1994, pp. 51-64.
- Lederberg, J., Shope, R.E. and Oaks, S.C. (eds.), op. cit. 15, p.73.
- 29. Epstein, P.R., "Biodiversity Questions", Science, Vol. 265, 9 September 1994. The "El Niño" effect is a naturally-occurring climatic phenomenon, affecting in particular the Pacific coast of South America, in which a massive body of warm water in the Pacific moves from west to east, rising as it moves. The phenomenon is associated with tropospheric warming and a shift in precipitation patterns, leading to drought in specific areas of the world and heavy rainfall in others. Southern Africa has repeatedly
- experienced drought in an El Niño period.
 30. Epstein, P.R., "Emerging.Diseases and Ecosystem Instability: New Threats to Public Health", *American Journal of Public Health*, 85, 1995, pp.168-172.
- 31. Makhoul, N., "Assessment and Implementation of Health Care Priorities in Developing Countries: Incompatible Paradigms and Competing Social Systems", *Social Sciences and Medicine*, Volume 19, 4, 1984, pp.373-384.

Swimming in a Sea of Oestrogens Chemical Hormone Disrupters

by

Sue Dibb

There is growing concern that a range of natural and synthetic chemicals, such as PCBs and dioxins and those contained in certain foods, detergents and plastics, can disrupt the body's delicate hormonal balance. Evidence is increasingly suggesting a link between increased human exposure to these chemicals which mimic oestrogen hormones and reproductive and sexual development disorders, reduced fertility and cancers in women and men.

Oestrogen hormones were first identified in the late 1920s, but it is only recently that many of their functions in the human body are beginning to be more fully understood. In women, most oestrogen is produced by the ovaries before the menopause. It regulates the menstrual cycle and pregnancy, lowers the risk of heart attack and osteoporosis (brittle bones in later years) but can also stimulate the growth of breast and uterine cancers. In men, the testicles produce oestrogen, though in much lower quantities than in women. High levels of oestrogen are known to inhibit growth of the testes in childhood and to lower sperm production in adulthood.

In the fetus and early infant, oestrogen plays an important role in sexual differentiation, and the formation and development of the reproductive organs in females and males. The balance between oestrogens, often thought of as female hormones, and androgens, male sex hormones, is critical at this stage of human development. Any disruption to this balance and to the hormone system seems to be more potent in the fetus and infant than in an adult.

Disruption

Concern over the adverse effects of human exposure to oestrogen which is not produced by the body or to chemicals which mimic oestrogen arose in the late 1970s when researchers, investigating the link between different organochlorine pesticides and cancer, began to see oestrogen and oestrogen mimics as a possible common denominator.

More recently, researchers investigating the rising incidence of reproductive development problems in humans believe there is now evidence to support the theory that human exposure to oestrogen-like chemicals, particularly as a fetus and during early childhood, is contributing to these problems.¹

In 1992, for example, Danish professor Neils Skakkerbaek published in the British Medical Journal a review of 61 scientific papers on semen quality which identified a dramatic 50 per cent decline in sperm counts in men worldwide since 1940.2 More recent studies from France, Belgium and the UK indicate that sperm quality as well as sperm counts have declined in recent decades, and that men born after 1950 are more likely to be affected.³ Over the past 50 years, the incidence of testicular cancer has doubled in most industrialized Western countries where it is now the most common cancer of young men, while defects of the male reproductive tract seem to have increased during the same period as well.4

In women, the incidence of breast cancer in Western Europe and the US has increased since 1940, and is the most common cancer found in women. Researchers are investigating the links between the disease and increased exposure throughout life to oestrogens and their mimics. Scientists are also concerned that environmental oestrogens may play a role in causing endometriosis, a painful, often disabling, disease affecting women in their early reproductive years which can lead to fertility problems. Formerly a rare condition, it now afflicts five million women in the US.⁵ In 1991, a multidisciplinary group of scientific experts met at Wingspread, Wisconsin, to discuss endocrine (hormone) disrupters in the environment and their effects on human and wildlife sexual development. They issued a consensus statement:

"A large number of [synthetic] chemicals that have been released into the environment, as well as a few natural ones, have the potential to disrupt the endocrine system of animals, including humans . . . Unless the environmental load of synthetic hormone disrupters is abated and controlled, large-scale dysfunction at the population level is possible".⁶

Environmental Pollutants

Human exposure to chemicals which can mimic oestrogen (exogenous oestrogens) has increased since the 1940s as manufactured chemicals began to be used on a wider scale. At least 37 chemicals have been identified as being able either to mimic oestrogens in the body or to interfere with the various systems that regulate the body's production of oestrogen and other sex-linked hormones. These chemicals include the chlorinated hydrocarbon, DDT, its breakdown product, DDE, some polychlorinated biphenyls (PCBs), dioxins, several pesticides and fungicides, and some chemicals used in detergents and plastics.

Many of these chemicals are resistant to biodegradation and are widely distributed in the environment; they enter the food chain and water supplies and, through consumption, accumulate in fat tissues in animals and humans. They can cross the

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Oestrogen Chemicals

Like other hormones, oestrogens act as messengers in the body, activating biological effects by binding to "receptors" within a cell nucleus. The binding "switches on" the receptor to initiate changes in cells, tissues and organs. By this means, oestrogen and other sex hormones activate a wide range of physiological events in puberty and adult life, but also irreversibly organize sexual differentiation and development in the fetus. Various complex hormonal regulatory and balancing mechanisms control the body's production of oestrogens and break them down into harmless substances which the body excretes.

Compounds or substances which have a sufficiently similar structure to human oestrogen can also "lock on" to a receptor. Some environmental pollutants, pharmaceutical drugs such as the contraceptive pill and the anti-breast cancer drug, tamoxifen, and plant oestrogens (phytoestrogens) are all capable of occupying oestrogenreceptors. Of these compounds, oestrogen agonists or mimics act in a way so as to add to the oestrogenic activity within the body.

Oestrogen antagonists, on the other hand, bind to the oestrogen receptor but do not activate the biological effects of oestrogen; they "lock on" but do not "turn the key" to activate oestrogenic activity, including the breakdown process. These antagonists may block the receptor in this way for extended periods, preventing endogenous oestrogens from binding to and activating the receptor, and thus reducing oestrogen processes in the body. The antibreast cancer drug, tamoxifen, appears to have the ability to suppress oestrogen and thereby to inhibit both the growth of oestrogen-fed tumours and the development of further tumours.

There is some evidence, however, that the body may become resistant to tamoxifen which, if continued to be taken, may actually promote tumour growth. In this way, tamoxifen's action is similar to those of phytoestrogens which can act either as oestrogen agonists or antagonists, depending on the dose, potency, duration and pattern of exposure. At high levels or after long-term exposure, oestrogens may become toxic, causing liver disease, haemorrhagic diseases and immune system disorders.

The age of the person seems to be another critical factor in determining the effects of oestrogen hormones and their mimics. The greatest effects seem to take place in the developing fetus and young infant, although these effects may not become apparent until later in life. In adult women, the biological effects of exposure to endogenous oestrogens differ depending on whether a woman is preor post-menopausal; after menopause (when ovulation and menstruation stops), a woman produces much less natural oestrogen.

As the metabolism of exogenous oestrogens is not identical to that of human or animal oestrogens, they are not subject to the hormonal regulatory and balancing mechanisms, including the chemical breakdown process. As a result, their actions are harder to predict. Weak exogenous oestrogens, for instance, can be relatively more potent at low blood concentrations than endogenous ones.

placenta from these tissues to the developing fetus.

While the evidence that exogenous oestrogens affect human development is not conclusive, there is strong supporting evidence from wildlife and laboratory animal studies, indicating that many of these chemicals are detrimentally affecting reproductive development.

Studies have found alterations in the semen quality of adult rats, exposed just after birth to PCBs via their mothers' milk. Amounts of the order of one nanogramme — one thousand millionth or 10^{-9} — of the chlorinated hydrocarbon TCDD (dioxin), given once to pregnant rats on day 15 of their pregnancy, seemed to have no effect on the mother, but, depending on the dose, the frequency of undescended testes in male offspring increased, and testicular weight and sperm count in adulthood was reduced.⁷

In humans and other mammals, sperm counts appear to be dependent upon the development of Sertoli cells during development in the womb and in early childhood. The Sertoli cells control sperm production, regulate the development of the urethra and the descent of the testicles in adolescence, and are affected by the follicle-stimulating hormone. It is thought that exogenous oestrogens can suppress the amount of follicle-stimulating hormone released from the pituitary gland, thereby decreasing Sertoli cell development.

In Florida, an alligator study identified low rates of egg-hatching among alligators in lakes where levels of DDE could be detected. Those eggs that were hatching were predominately female; males that hatched had abnormally small penises. Similarly, studies of birds in the US in areas with high levels of PCBs found female gulls and terns with additional egg-laying organs and males with a mix of male and female reproductive organs.⁸

Research in Texas has shown that in male turtles hatched from eggs the shells of which had been applied with very low doses of oestrogen-mimicking chemicals, ovaries were forming in turtles that were otherwise male.⁹ In the UK, researchers at Brunel University found that male rainbow trout caged near the outfalls of sewage treatment plants were producing large amounts of an egg-yolk protein, vitellogenin, which is normally produced in adult female fish in response to oestrogen or oestrogen mimics. Analysis of the water from the plants indicated oestrogenic chemicals, including breakdown products of a chemical used in some detergents, plastics and spermicides.¹⁰

The first generation of people exposed as fetuses or young infants to chemicals which act like or mimic oestrogen on such a scale began reaching their reproductive ages in the 1970s. Dr Richard Sharpe of the British Medical Research Council's Reproductive Biology Unit in Edinburgh points out that because some consequences of this exposure may not become manifest for some 20 to 40 years after birth, the extent to which children born today might be affected may not be clear until well into the next century.

Besides reproductive development problems, some scientists believe that oestrogen-mimicking pollutants add to adult oestrogen exposure as well, increasing in particular the risk of oestrogensensitive breast tumours in women. This cause is thought to account for much of the increase in breast cancer in recent years. A 1987 US pilot study at Hartford Hospital, Connecticut found that women with breast cancer had significantly higher concentrations of PCBs, DDT and other pesticides in their bodies than women without breast cancer.¹¹ Canadian researchers have postulated a link between higher levels of DDE in breast tissue and the risk of developing the type of breast cancer which is promoted by high levels of oestrogen.¹² — of phytoestrogens from soya can induce changes in women's menstrual cycles, including lengthening of the cycle and reducing mid-cycle surges of the luteinizing and follicle-stimulating hormones.¹⁷

Pharmaceutical Drugs

Pharmaceutical drugs are another source of exogenous oestrogens. Long-term use of the oral contraceptive pill, particularly from a young age, has also been associated with an increased risk of breast cancer. Use of the Pill has also raised concern that the synthetic oestrogen, ethinyl oestradiol, used in many formulations, is contaminating water supplies. However, while it has been detected in some water sources, it does not seem to be present in significant concentrations in drinking water, and environmental pollutants seem to be a far greater source of exogenous oestrogens.13

More is known about another synthetic oestrogen, diethylstilbestrol (DES), which was widely used as a growth promoter in cattle and other livestock from the 1950s until the early 1980s, when it was banned.¹⁴ From 1948-1971, DES was also prescribed to over five million women diagnosed as having low levels of oestrogen, mainly in the US but also in

the UK.¹⁵ Daughters of women who were given DES have a higher risk of developing rare vaginal cancers while sons have an increased risk of abnormally-small testes, malformed penises, testicular cancer, low semen volume and low sperm counts.¹⁶ Today, endocrinologists regard the effect of DES on human offspring as a model for the problems that other oestrogen-like substances may cause.

Plant Oestrogens

A third source of human exposure to oestrogens is phytoestrogens — oestrogens occurring naturally in many plants and fungi which are biologically active in humans and animals. Even moderate consumption — 45 milligrammes per day

Refuse being loaded onto chutes for incinceration. The incineration of household and commercial wastes is a major soucre of dioxins which can act as oestrogen mimics.

Soya meal is by far the richest source of phytoestrogens in human diets. A byproduct of the more lucrative soya oil market, consumption of soya meal has increased considerably in the past two or more decades. Many vegetarians and vegans eat soya as a substitute for meat protein while some babies are given specially-formulated soya milks. Soya is also increasingly used by animal feed manufacturers as a cheap protein to replace fishmeal, meatmeal or skim milk powder. Soya meal is also now found in many feeds for pets, commercial livestock and zoo animals.

Phytoestrogens have been found to be toxic in many animal species, reportedly causing reproductive disorders, infertility and cancers in many species such as sheep, rats, cheetahs, birds, dogs, hamsters, mice, cattle, rabbits and even fish.

Their role in human health, however, is controversial. Phytoestrogens seem to exhibit a complex dual role in humans: they can act either as an oestrogen agonist

> — adding to the oestrogenic activity in the body — or as an oestrogen antagonist — blocking the effects of endogenous oestrogen. The action seems to be in part dependent on the dose and age of the person. (*See* Box, p.28)

> Some scientists have suggested that, because phytoestrogens can block the availability and actions of endogenous oestrogen in the body, a diet rich in phytoestrogens may reduce the risk of developing breast cancer.18 Much of the supporting evidence for this theory is epidemiological, based largely on data from Japan and China where women have much lower rates of breast cancer and consume more soya-based products than Westerners.

> But dietary phytoestrogens may be only one factor in these lower rates. Traditional Japanese and Chinese diets are also much lower in fat than Western diets — typically less than 20 per cent of calories come from fat compared to around 40 per cent in the UK and the US. As the relative consumption of fats (especially animal fats), proteins, refined carbohydrates and fibre affects the metabolism and excretion of oestrogen produced

by the body, a low fibre, high animal fat diet leads to lesser amounts of endogenous oestrogens being broken down and excreted. Instead, they are reabsorbed into the body from the gut. As a result, a woman is exposed to increased amounts of her own oestrogens, which could promote the growth of breast tumours. In addition, the oestrogen-blocking action of phytoestrogens may also reduce fertility by suppressing ovulation.

Other scientists maintain that phytoestrogens, along with other exogenous oestrogens, should be minimized in women who already have oestrogen-induced breast cancer, as well as in pregnant women and in young infants, arguing that phytoestrogens can add to the oestrogenic activity in the

Soya Infant Formula

A 1994 report from New Zealand examining the toxicity of soya questions the suitability of feeding babies soya-based infant formulas. The report was co-authored by New Zealand aviculturists Richard and Valerie James, among others, who became mystified by the range of health problems their breeding parrots — some 600 birds of 40 species — were developing, including infertility, reproductive disorders, premature maturity and death caused by immune system failure. Confering with other experienced aviculturists and animal breeders in New Zealand, Australia and the US, they discovered widespread breeding, growth and behavioural problems and deaths in finches, rabbits, poultry, guinea pigs, cats and fish. Analyses of commercial bird feed and other animal feed indicated that soya ingredients were associated with the toxic effects.

The Jameses then became concerned about the possible effects on infants fed a soya-milk formula. They had observed various physical and behavioural symptoms in their own children who had been fed soya formula several years previously and were aware that there were similiarities betweeen bird food and soya milks for babies.

Soya-based infant formulas were developed some 20 years ago for bottle-fed infants who have allergies to cows' milk protein. Soya formula is often recommended as an alternative for babies with allergies, but less well known are its other potential effects, including the allergies it actually causes. In the UK, about three per cent of babies are fed soya formula; the level is much higher in New Zealand and the US.

From analyses of levels of isoflavones (soya phytoestrogens) in soya-based infant formulas available in New Zealand, the researchers calculated that the biological effects of phytoestrogens typically consumed by a baby drinking soya milk would be 100 times greater than the amount of natural oestrogen the child would receive from breast milk. They estimated that, on a weight-for-weight basis, this is equivalent to giving a baby several contraceptive hormone pills a day. Their research prompted the New Zealand government to undertake a review of soya-based products for human consumption and to take the issue up with the World Health Organization.

In the UK, the government's expert Committee on

Toxicity recommended in 1992 that levels of phytoestrogens in soya baby milks and other soya foods for children should be analysed as part of its review of natural toxicants in foods, yet that research has not started. The Food Commission, an independent consumer watchdog on food, is urging the UK's Department of Health and the Ministry of Agriculture, Fisheries and Food (MAFF) to ensure that the recommended research is given urgent priority. The Department of Health recommends that soya infant formula should not be a first choice. As soya infant formulas have only been generally available in the last 20 years, it could be too early to detect any possible long-term effects on infants.

Dr Donald Shutt, a former consultant to the World Health Organization on phytoestrogens, has stated that more research is urgently needed to assess the potential oestroenicity of soya formulas for infants. One problem, however, is that it is neither easy nor ethical to study the effects of phytoestrogens on babies. One recent review of the risks and benefits of phytoestrogens warned that "*in utero* and childhood exposures to exogenous oestrogenic agents could easily exceed the narrow bounds of optimal or physiological levels and thus be of significant toxicological concern".

US researchers Patricia Whitten and Frederick Naftolin have studied the effects of dietary phytoestrogens in laboratory rats in the US and found that the reproductive cycles of female offspring of mothers who had been fed a low-level phytoestrogen diet during lactation were disrupted — in effect, the offspring did not ovulate. Although caution is needed in extrapolating between species, the researchers concluded that, as processes involved in human sexual differentiation continue in the early years of life, "the common inclusion of soy protein in infant formulas may be a cause for concern".

As a result, Professor Clifford Irvine is highly critical of the soya industry and the way that it promotes its products: "In my opinion, the satisfaction with which the soy lobby highlights the beneficial effect of isoflavones on a number of Western adult diseases and brushes aside potential effect on neonates and infants is almost obscene."

body. (See Box, p.28) New Zealand reproductive endocrinologist Professor Clifford Irvine is therefore cautious about the wisdom of advocating an increase in foods rich in phytoestrogens, such as soya:

"The evidence that isoflavones [soya phytoestrogens] are beneficial is based on their short-term effects in low dosage in which they function as an anti-oestrogen. However, the action of the isoflavones is very similar to that of the widely-used anti-cancer drug, tamoxifen. Although tamoxifen has been a lifesaving drug in adults, its action in the new-born is not so benign. In fact, it is almost inevitable that if small doses of a substance with antioestrogenic capabilities can control cancer in adults, these same properties will affect sexual development in the neonate."¹⁹

Dr Richard Sharpe also recommends extreme caution with regard to increasing amounts of phytoestrogen:

"We just don't know enough about the effects of oestrogen-type chemicals on the developing foetus and new born babies. Therefore, I would recommend that exposure to oestrogens from whatever source should be kept to a minimum especially during childhood."²⁰

Safe Exposure?

Is there a safe level of exposure to additional oestrogens and oestrogen-like substances? Dr Sharpe provides a warning:

"Any oestrogen exposure during childhood . . . is excessive, bearing in mind the minimal endogenous oestrogen production at this time. Furthermore, in assessing risk for breast cancer in women, lifetime exposure to oestrogens is placed top of the list, so in this context if in no other, any exposure to environmental oestrogenic chemicals might be viewed as being undesirable."²¹

Scientists at the 1991 Wingspread Conference in the US agreed that action is needed to reduce exposure to synthetic chemicals already in the environment and to prevent the release of new products that can act as endocrine disrupters. They also recommended that reproductive effects should be given greater priority when health risks are evaluated during the approval process for chemicals and that all new products, their by-products and all persistent, bioaccumulative products released into the environment in the past should be screened for hormonal activity.22 However, most regulatory bodies are only just beginning to consider such measures.

Phasing Out

Ann Link of the UK Women's Environmental Network, which is campaigning for a complete phaseout of chlorine compounds, says industry needs to take action:

"Large-scale industries such as plastics, detergents and cosmetics need to reduce the number of unnecessary

Notes and References

- Sharpe, R., "Could environmental, oestrogenic chemicals be responsible for some disorders of human male reproductive development?", *Current Opinion in Urology*, 4, 1994, pp.295-301.
- Carlsen, E., Giwercman, A., Keiding, N. and Skakkebaek, N., "Evidence for decreasing quality of semen during past 50 years", *British Medical Journal*, Vol 305, 1992, pp.609-613.
- See Ginsberg, J., Okolo, S., Prelevie, G. and Hardiman, P., "Residence in the London Area and Sperm Density (letter)", *The Lancet*, Vol 343, 1994, p.230; Van Waelegham, K., DeClerq, N., Vermeulen, L., Schoonjans, F. and Comhaire, F., "Deterioration of Sperm Quality in Young Belgian Men During Recent Decades (abstract), *Hum. Reprod.* 9 (suppl. 4), 1994, p.73; Irvine, D.S., "Falling Sperm Quality (letter)", *British Medical Journal* 309, 1994, p.476; Auger, J., Czyglik, F., Kuntsmann, J.M. and Jouannet, P., "Significant Decrease of Semen Characteristics of Fertile Men from the Paris Area During the Last 20 Years (abstract)", *Hum. Reprod.* 9 (suppl.), 1994, p.72.
- Sharpe, R. and Skakkebaek, N., "Are oestrogens involved in falling sperm counts and disorders of the male reproductive tract?", *The Lancet*, Vol. 341, 1993, pp.1392-1395.
- Hileman, B., "Environmental Estrogens Linked to Reproductive Abnormalities", *Cancer, Chemistry* and Engineering News, 31 January 1994.
- Colborn, T. and Clement, C. (eds.), "Chemicallyinduced alterations in sexual and functional development: The wildlife/human connection", in Advances in Modern Environmental Toxicology, Princeton Scientific Publishing Co. Inc, Princeton, New Jersey, 1992.
- 7. See, for example, ibid, and Sharpe, R., op. cit. 1.
- 8. Hileman, B., op. cit. 5.
- See Weiss, R., "Oestrogen in the Environment", *The Washington Post*, 25 January 1994.
- 10. Purdom, C.E., Hardiman, P.A., Bye, V.J., Eno,

Achieving these objectives will not be easy. Cancer prevention, for instance, is just one area of public health where conflicts between commercial, academic and public interests are spilling over into the political arena. Confronting what they see as medical inertia in the face of a breast cancer epidemic, some women in the US are following the lead of AIDS activists and "acting up" to campaign for better funding for research into preventing breast cancer, rather than research into drug treatments used once the cancer has appeared. Yet preventive funding is much harder to secure than funding for drug therapy studies which could reap financial benefits for the drug industry. US health and environment campaigner Dr Samuel S Epstein recently remarked:

N.C., Tyler, C.R. and Sumpter, J.P., "Estrogenic Effects of Effluents from Sewage Treatment Works", *Chemistry and Ecology* 8, 1994, pp.275-285.

- Falk, F., Ricci, A., Wolff, M.S. et al., "Pesticides and polychlorinated biphenyl residues in human breast lipids and their relation to breast cancer", *Archives of Environmental Health* 47, 1992, pp.143-6.
- Dewailly, E., Dodin, S., Verreault, R. et al., "High organochlorine body burden in women with oestrogen receptor-positive breast cancer", *Journal of the National Cancer Institute* 85, 1994, pp.648-52.
- 13. Purdom, C.E. et al. op. cit. 10.
- 14. In 1981, orally-active anabolic oestrogens, including DES, were banned in Europe. The anabolic oestrogens used now in the livestock industry are not orally active.
- 15. Sharpe, R. and Skakkebaek, N., op. cit. 4.
- Hines, M., "Surrounded by estrogens? Considerations for neurobehavioural development in human beings", in Colborn, T. and Clement, C., op. cit. 6.
- 17. One study at the Dunn Nutrition Unit in Cambridge charted hormonal changes in six women who added moderate amounts of soya (60 grammes containing 45 milligrammes of isoflavones) to their diet over one month. The menstrual cycle of all the women lengthened by up to five days while the usual surges of luteinizing hormone and follicle-stimulating hormone (which stimulate ovulation) in midcycle were suppressed. The researchers hypothesize that phytoestrogens may act in a similar way to the anti-breast cancer drug, tamoxifen, by blocking the availability and actions of natural oestrogen in the body. See Cassidy, A., Bingham, S. and Setchell, K., "Biological effects of a diet of soy protein rich in isoflavones on the menstrual cycle of premenopausal women", American Journal of

"Those who seek to reform national cancer policy and environmental regulations will confront powerful opposition from the cancer establishment, industrial polluters and pharmaceutical companies, all of whom are well served by the current inattention to cancer prevention. Adequate reforms will require executive and legislative action — a goal that will be achieved only with strong support from the independent scientific and public health communities, along with concerned grass-roots citizens groups."²⁴

Although the study of oestrogen mimics is in its infancy, a number of synthetic and naturally-occurring substances are already known to mimic oestrogen and have the potential to disrupt the body's delicate hormonal balance. While further research is urgently needed to understand better the risks these chemicals pose, action should be taken now to minimize human exposure to toxic chemicals, particularly during fetal development and childhood.

Clinical Nutrition 60, 1994, pp.333-40. Other researchers hypothesize that in adults of reproductive age, phytoestrogens act to regulate oestrogenic activity by reducing total oestrogenic bioactivity in the upper end of the physiologic range, but increasing total oestrogenic bioactivity in the lower end of the physiologic range, thus lowering the risk of disease over time. See Clarkson, T., Anthony, M. and Hughes, C., "Estrogenic Soybean Isoflavones and Chronic Disease", *Trends Endocrinol. Metab.* Vol. 6, Issue 1, 1995, pp.11-16.

- 18. Progress in understanding the significance of plant oestrogens has been slow and there are large gaps in knowledge. Sheeham maintains that there is a need to understand more fully adverse versus beneficial effects of phytoestrogens. While most research has focused on the endocrine activity of females, there is little research into males, or into possible developmental effects of phytoestrogens on females and males. See Sheeham, "The Case for Expanded Phyoestrogen Research", Proc. Soc. Exp. Biol, Vol 208.
- Professor Clifford Irvine, personal communication, 1995.
- 20. The Food Commission, "New Zealand research questions safety of hormones in soya baby milks", Living Earth & The Food Magazine, 3, January 1995, p.28. See also James, R.F., James, V.A., Woodhams, D.J. and Fitzpatrick, M.G., The Toxicity of Soybeans and Related Products, Auckland, New Zealand, 1994.
- 21. Sharpe, R., op. cit. 1.
- 22. Colborn, T. and Clement, C. (eds.), op. cit. 6.
- Ann Link, personal communication, 1995. See also Chlorine pollution and our environment, Women's Environmental Network Information Briefing, (1994)
- Clorfene-Casten, L., "The Environmental Link to Breast Cancer in the Politics of Breast Cancer, *Ms. Magazine*, May/June 1993.

Outdated Modernity

RISK SOCIETY: Towards a New Modernity by Ulrich Beck, SAGE Publications, London, New Delhi, Newbury Park, 1992, £13.95/\$13.95, (pb), 260pp. ISBN 0-8039-8346-8 (originally published in German as *Risikogesellschaft: Auf dem Weg in eine andere Moderne*, Suhrkamp Verlag, Frankfurt am Main, 1986).

The main contention of *Risk Society* is that industrial society is being transformed into a risk society:

"The system of coordinates in which life and thinking are fastened in industrial modernity — the axes of gender, family and occupation, the belief in science and progress begins to shake, and a new twilight of opportunities and hazards comes into existence — the contours of the risk society."

The risks and threats associated with new and ever more powerful technologies such as nuclear power and genetic engineering are a principal concern for Ulrich Beck who argues that such risks call into question the legitimacy of modernization. Whereas the perceived benefits from technology used to be significant compared with associated risks, today the "side effects" of technological advance take centre stage. Furthermore, some of the risks now confronting humanity are of a global nature and cannot be side-stepped, regardless of one's wealth. In Beck's words, "poverty is hierarchic, smog is democratic"; in the risk society, social class begins to lose its relevance as a defining characteristic.

The modernization process, Beck contends, is becoming reflexive: having long stepped out of the shadow of tradition, modernization now has to take as its reference point not the past, but the changes and the effects of change it has itself produced. Science too is being forced to become reflexive because "in its progress, science has just lost the truth as a schoolboy loses his milk money ."

But despite the growing awareness among scientists of the challenges presented to science as traditionally practised, Beck contends that its practice is not changing radically. Indeed, it remains unclear how science can be made to change so that the risks and hazards accompanying technological progress are placed on at least equal footing with the often exaggerated promises of progress. That they are not motivates Beck's scathing critique of technical risk assessment, which purports to analyse hazards associated with new technologies in a scientific manner. Increasingly exacting scientific standards, especially those relating to proof of causality, reduce the number of risks that are recognized as such, thereby multiplying the risks to which people and the biosphere are exposed.

Since many new products and technologies can only be properly tested once they have been released or widely used, "society is becoming a laboratory". Beck notes that this does not stop scientists determining, before release or use, "acceptable levels" for exposure to toxins on the basis of bogus claims to truth and objectivity. This farce -- "a very complicated, verbose and number-intensive way of saying: we [the scientists] do not know either" - serves to legitimize a disregard for the empirical evidence coming from the suffering of humans and ecosystems who endure the consequences of a regime which effectively sanctions their poisoning.

Beck traces the origin of this tragic state of affairs to the "economic Cyclopia of techno-scientific rationality", which allows for the perception of possibilities for productivity increase, but is blind to the risks and problems associated with new technology. In Western societies, this results from the separation of the political-economic sphere from the techno-economic sphere, the former being the domain of democratic politics, the latter that of "non-politics". Technological changes which shape society have thereby been removed from political legitimation.

Such a "no-questions-asked" attitude, which means that "progress replaces voting", is now being questioned worldwide by citizens outside the formal political system. In this way, politics is prised open by a public increasingly disillusioned by the (in)actions of their political representatives.

Readers are invited to make the link between the emergence of new protest movements organizing around risk and risk-related issues and the effects of modernization on individual lives. Beck suggests that risk comes to play a prominent part in people's lives largely as a result of an increasing tendency towards individualization in society. The main causes of this individualization are taken to be the changing status of women, increased mobility, competition and the move to a society of flexible and pluralized underemployment in place of full employment.

Individualization and the breakdown of tradition in society force individuals to become authors of their own biographies. That is, people have to make a growing number of decisions about themselves whereas previously, automatic ascription to class, gender and family roles meant that no decision was there to be made. Biographies become reflexive as individuals seek to learn how best to cope with the risks associated with the decisions and choices demanded of them in their daily lives.

One psychological effect of this is that when what are essentially social problems come to the fore, individuals internalize them as personal failure. Another way in which individuals respond to societal changes is in coming together with like-minded people to form protest movements.

Risk Society is incredibly thought-provoking and has quickly established itself as one of the most significant works of contemporary social analysis. A book of enormous breadth, it raises several issues of critical importance in contemporary society. However, some of it appears specific to the German experience, and in parts it is heavy going, probably reflecting the density of the analysis rather than its translation. Despite this, there are many memorable phrases and passages throughout the book which lend colour to the often disturbing subject matter.

Dominic Hogg

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Damming the Gorges

YANGTZE! YANGTZE! by Dai Qing, edited by Patricia Adams and John Thibodeau, Earthscan, 1994, £12.95/ \$14.95, 295pp. (pb) ISBN 1-85383-187-5

DAMNING THE THREE GORGES: What Dam Builders Don't Want You To Know, edited by Margaret Barber and Grainne Ryder, Earthscan, 1993, £12.95/ \$13.95, 183pp (pb) ISBN 1-85383-186-7

Imagine a flood stretching the equivalent of the distance between London and Edinburgh, three miles wide and 500 feet deep. Some 1.2 million people — a population the size of Birmingham's — have had to be evacuated; 13 cities, 140 towns and villages have been destroyed, and over hundreds of factories, mines and power stations flooded.

This will be the result of building the world's largest dam, 185 metres high, at the Three Gorges on the Yangtze river in China. Such a dam has been planned since the 1920s, but has received considerable opposition inside and outside of the country, not least because of the huge resettlement and rebuilding involved. The project finally received the go-ahead in 1992 at an estimated cost of between \$22 to \$34 billion. Excavation has already begun and the first concrete has started to flow on the construction site - 1.4 million tons of cement will be used each year during its 20-year construction period, the equivalent of almost 4,000 tons a day.

The Three Gorges on the Yangtze river are among the natural wonders of the world. Their beauty and size have inspired generations of poets, writers, painters and sculptors, and they have been an attraction for visitors since ancient times. Yet all may soon be confined to the history books if the Chinese government and its funders are allowed to continue with plans to dam the river, the level of which will rise by over 300 feet.

These two books, both collaborations between Chinese and Canadians but each with a distinct approach, provide a comprehensive and unique insight into the workings of one of the world's most secretive regimes and what may be one of humankind's greatest follies.

Yangtze! Yangtze! is a fascinating mixture of essays, interviews, observations and statements by Chinese scientists, journalists, politicians and intellectuals opposed to the Three Gorges dam. The various contributors include members of the Communist party, former senior party officials and eminent intellectuals, making the book's indictment of the Chinese government and the dam proposal all the more compelling.

Compiled by Dai Qing, a journalist, former secret agent and communist party member, *Yangtze! Yangtze!* was first published in China at a time of increased media freedom a few months before the June 1989 Tiananmen Square massacre. The book's attacks on the Chinese government certainly gave momentum to the growing opposition movement and may have prompted the government to react more quickly to the protest than they might otherwise have done.

After Tiananmen, the Chinese publishers of the book were blamed by the authorities for "engaging in preparing opinions for the chaos" — in other words, for supporting and causing the unrest. The book was banned, and Dai Qing arrested and told she would be executed; she was later released and exiled.

One chapter in particular stands out in the English edition, not only because its author is Li Rui, Mao's former Industrial Secretary, but also because of its frankness and insight into the workings of the Communist regime. Not included in the first Chinese edition, Li's chapter is in the form of a letter to the leadership of the communist party in 1993:

"Mao wrote, 'We need an opposition opinion'. More than 27 years have passed since that . . . was written; however Mao's instructions are not out of date. Listen to both sides and you will be enlightened."

Yangtze! Yangtze! is at times very technical and is certainly not an easy read, but for the information and insights it provides and because of the circumstances and passion surrounding its publication, it is highly recommended. The book's spirit is best summed up by a concluding poem by Bei Dao:

"I do not believe that the Chinese will forever / refuse to think for themselves; / I do not believe that the Chinese will never / speak out through their writings; / I do not believe that morality and justice will / vanish in the face of repression; / I do not believe that in an age in which / we are in communication with the world / 'freedom of speech' will remain an empty phrase."

Damning The Three Gorges is a very different book, put together by researchers from Canada's independent environmental advocacy organization, Probe International. Editors Margaret Barber and Grainne Ryder have drawn on the expertise of leading international experts on hydrology, engineering and geography to produce a book which examines and refutes, piece by piece, the reasons given by the Chinese government and the project's funders for building the dam. Originally published in 1990 in response to a Canadian-World Bank feasibility study of the Three Gorges project, it has been reissued with additional chapters on sedimentation - which is likely to cause the reservoir to silt up entirely within about two hundred years - and a chronicle of political events leading to the approval of the dam by the National People's Congress in April 1992.

Each key issue relating to the Three Gorges project — resettlement, sedimentation, navigation, environmental impact, finance — is clearly examined by appropriate world experts. Many of the arguments are highly technical but they are dealt with clearly and accessibly, for the least scientific of minds.

Many construction and hydroelectric experts have submitted evidence to the Chinese government stating that the sheer weight of water behind the dam would be capable of causing an earthquake. A UK hydrology expert estimates that it would take 10 years to assess the environmental impact of the dam and reservoir — and that many possible consequences cannot be assessed because a project on this scale has never been attempted before.

In a chapter on 'Missing Energy Perspectives", the author, Dr Vaclav Smil, puts forward some common sense alternatives to building such a monolith as the Three Gorges dam. Smil, a professor of geography at the University of Manitoba, argues that the key to China's energy problems is not to build one huge and flawed water management project, but smaller, easier-to-maintain and manage projects, providing far more cost-effective and efficient power.

More efficient energy production by China's current power generation facilities would go a long to way to solving its perceived lack of energy. Dr Smil has calculated that it is technically feasible to produce 11,103 hydroelectric dams in China, with a total capacity 27 times that of the Yangtze Dam. This cuts to the core of the argument:build small, efficient and feasible projects with less impact on the environment than the "boom or bust" glory project of a regime struggling to find its political legitimacy.

Dai Qing, who writes the foreword to the second edition, puts the book in its proper perspective:

"It comes at a time . . . when the green movement has received increased understanding and support around the world because the dismantling of communist systems in Eastern Europe and the Soviet Union has led to a deeper understanding of humanity and its relationship with nature."

The Probe editors add that "under the current [Chinese] regime, someone would be imprisoned for producing a critique of a government feasibility study: because they cannot produce such a critique, we must."

Mark Alwen

Mark Alwen is a freelance journalist, political consultant and former Parliamentary researcher.

Border Troubles

ON THE LINE: Life on the US-Mexican border, by Augusta Dwyer, Latin America Bureau, 1 Amwell St, London EC1R 1UL, (Central Books) 1994, £8.99 (pb), ISBN 0-906-15684-X.

Augusta Dwyer travelled through the cities of the US-Mexican border to explore three questions: What happens when a wealthy nation moves hundreds of its factories to a much poorer country next door? What happens to the dusty, halfforgotten, mostly rural towns when they are sucked overnight into the industrial world? And what happens when hundreds of workers from the poor nation cross the border illegally to find jobs in the wealthy neighbour's economy? The picture, portrayed in *On the Line*, is one of poverty, exploitation and a lack of democracy for workers on both sides of the dividing line.

Clustered along the southern side of the US/Mexican border are over 2,000 export-assembly plants (maguiladoras), where half a million people, mainly women, work for an average of less than a dollar an hour. Dwyer gives a vivid portrait of the appalling conditions in the plants. Health and safety violations abound and environmental regulations are ignored. Workers handle hazardous chemicals with little or no protection, waste is dumped into waterways and unregulated landfills, and gas leaks and explosions occur with alarming regularity. Unfair labour practices, including the sacking of workers who attempt to organize, are common, as is the sexual harassment of women and the hiring of minors. Alongside the plants, suburbs of shacks house the workers and their families. Crowded and dirty, they frequently lack running water, sanitation or electricity.

The majority of *maquiladora* plants are owned by US companies. Machinery and raw materials are "temporarily imported" to Mexico to be assembled and shipped out again. The companies are exempt from Mexico's two per cent assets tax, paying only a small tax on the value added to the product, which then goes back into the US, duty free.

When the first maquiladoras were built in the 1960s, the scheme was supported by the US government, which hoped that as well as increasing the profitability of US companies, the industrialization of the border zone would reduce illegal immigration by providing employment within Mexico. As Dwyer points out, the opposite has been true, for in attracting migrants from other parts of Mexico to the border region, the maquiladoras have in turn encouraged the flow of migrants north into the United States. Thousands of Mexicans cross the border each day, in search of employment and an improved standard of living. However, reality is often very different from the dream. Blamed for rising crime, high taxes and

unemployment, the migrants face racism and discrimination on a daily basis.

Dwyer suggests that it is the very status of workers as migrants with homes and families in Mexico that makes them attractive as workers, as this makes them more flexible. They are prepared to work extra hours and days when necessary and then return home when they are not needed. In addition, they represent no added social security costs for the company, nor any social costs to the US economy. According to Dwyer, rather than depressing US wages, the migrants compete only against each other, filling the gap which has resulted from an increase in low paid, non-unionized work, which is unattractive to many US Americans. Their very illegality is what makes them so useful.

"What better way to keep the labour force docile, undemanding and above all unorganized, than placing them under constant threat of deportation? American societies continue to fear migrants while hiring them to trim their hedges and lawns, and buying the products they make more cheaply".

Intercut with well-researched historical and statistical detail, *On the Line* is brought to life by the stories of ordinary Mexicans which Dwyer recounts *maquiladora* workers, union activists, illegal migrants — whose lives have been shaped by the conditions of poverty and injustice on the border and who are organising to resist exploitation and the destruction of their environment.

One of those interviewed is Lupe Torres, a former maquiladora worker who runs the Border Committee for Working Women in the city of Matamoros, teaching workers about their labour rights. Graciela Erives, although unqualified, has practised labour law in Ciudad Juárez for 13 years, successfully suing for the reinstatement of *maquiladora* workers fired for demanding better working conditions and pay. Argimiro Morales works with the Mixtec Popular Civic Community, providing legal and social services to Mexicans in California, while Roberto Martínez, a fifth-generation Mexican living in the US, documents abuses of Mexican immigrants along the border.

It is ordinary Mexicans such as these, says Dwyer, who by organizing and working together can bring about change from below. In the words of Mary, a *maquiladora* worker from the border town of Reynosa:

"People know they have to unite. That way they'll be stronger, they'll find the courage to fight the companies. That's why we've got to keep meeting and find a way to change our situation."

Emma Pearce

Emma Pearce is a freelance environmental journalist who has worked in Peru and Ecuador.

Genetic Goldrush

THE GENE HUNTERS (video), Zef Productions (in association with Television Trust for the Environment, Prince Albert Road, London NW1 4RZ, UK, for Channel 4), Producer Luke Holland, Director Ian Taylor, 1995, 51 minutes.

The wave of international concern for vanishing biological diversity has identified a new field for prospecting — vanishing peoples. The US-based Human Genome Diversity Project is intent on collecting body tissue samples from 700 "endangered" indigenous societies, whom it refers to as "isolates of historic interest". It aims to "immortalize" these peoples by establishing viable cell lines in laboratories so as to search for unique DNA sequences that may offer clues to genetically-caused diseases and to potentially lucrative cures.

This fascinating, well-researched and sensitive documentary, *The Gene Hunters*, presents the moral dilemmas of this "genetic goldrush". The proponents argue that the collection and eventually patenting of rare human cell-types and genes from these peoples is justified for the "greater human good". The peoples themselves have rather different opinions. Leonora Zalabata, spokesperson for the Arhuaco people of northern Colombia, explains:

"Our land, our culture, our sub-soil, our ideology and our traditions have

all been exploited. This could be another form of exploitation, only this time they are using *us* as raw materials."

George Annas, Professor of Medical Ethics at the Massachusetts Institute of Technology, agrees:

"We're taking from them their DNA, which we now consider like gold. It's even worse than standard colonialism and exploitation because we are taking the one thing that we value. And after we take that, we have no real interest in whether they live or die."

Nor has Ray Apodaca of the National Congress of American Indians much sympathy for the "pure science" justification of this research, that it will reveal the history of human migrations:

"We know where we came from, and we know who we are, and we think we know where we are going. Why do we need to know anything else? I mean, is this for their benefit? It certainly isn't for ours."

Apodaca recalls earlier "scientific" investigations into the unique characteristics of Native Americans, which led to hundreds of Indian graves' being robbed in the last century to measure skull sizes and estimate racial intelligence. Taking people's blood and other tissues in the name of science and global benefits today is not very different and has led to bitter recriminations.

Behind the new rhetoric lie the same attitudes which treat indigenous peoples as inferior and ignorant and therefore deny their rights. As Leonora Zalabata says:

"They haven't been honest. They haven't told the indigenous authorities what they are looking for. We think the way they have taken away these samples is arbitrary. We don't want to be guinea pigs for their experiments."

Her complaint highlights a key issue in this moral debate — informed consent.

Do the individuals who are giving these body samples know what is intended to be done with them? Are they consulted about further applications of the scientific findings? Are they assured of a share of any benefits or profits?

High in the Sierra Nevada in Colombia, geneticists from the Bogota-based Genetics Institute, accompanied by scientists from pharmaceutical giant Hoffman-La Roche, draw blood from isolated Asario Indians and provide a telling answer to such questions. "In fact, we don't tell every community that we are immortalizing their cells", admits Dr Alberto Gomez. On the contrary, the Indians are persuaded to allow the visiting doctors to take their blood by offers of

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one-off medical treatments, which these isolated peoples have little chance of obtaining otherwise.

Nor are the communities informed about any subsequent scientific findings. Patents on cell lines are being taken out without the knowledge and consent of the local people. Indeed, in a startling test case documented in *The Gene Hunters*, the California Supreme Court has ruled that a biotechnology company may patent a person's genes, even when that person has not only refused to give their consent but has taken the matter to court.

Is it ethical to ignore tribal peoples' rights and interests for the "greater good"? George Annas thinks not:

"'It is virtually impossible to get the informed consent of indigenous people for this. Number one, I think, because if they understand the project, they would refuse and, number two, if they don't understand, they can't give consent. So it is total exploitation."

Scientists, however, are concerned that there may never be another chance to take tissue samples from these peoples: they may soon die out, taking their genetic secrets with them. One way out of this conundrum might be benefit sharing: entering into contracts with indigenous peoples to ensure that they get a cut of any profits. This is a problematic suggestion. As the film points out, most indigenous people have learned to mistrust foreigners' promises as they have invariably proved to be false. But if there was benefit sharing, how would it be ensured that profits did return to the community, and who would oversee the honouring of such agreements?

The film's sympathies for the rights of indigenous peoples are clear, but it leaves viewers to decide for themselves. The words of Leonora Zalabata will stick in my mind:

"Science and technology solve problems, but they are also aggressive. But our way of looking after humanity and helping to save the world, of looking after the earth and making a brotherhood of mankind is done without technology. Our technology is in the head, the heart and the spirit. That is different."

The only just solution is to enforce a respect for human rights, not just immortalize their genes.

Marcus Colchester

Marcus Colchester is director of the Forest Peoples's Programme of the World Rainforest Movement.

BOOKS DIGEST

 A VOICE FOR THE EXCLUDED: Popular Participation in Development: Utopia or Necessity?, by Matthias Stiefel and Marshall Wolfe, Zed Books Ltd, London and New Jersey (in association with UNRISD), 1994, £15.95/ \$25.00 (pb), 265pp. ISBN 1-85649-248-6.

"Participation", like "sustainable development", has become a catchword that everyone advocates, each defines — and few put into practice. Through wide-ranging case studies, this book analyses the actions of NGOs, and state and international agencies to encourage, co-opt or undermine participation on the part of those "excluded" from development. The authors point out that "participation" programmes are often aimed at social control.

 UNEQUAL PROTECTION: Environmental Justice and Communities of Color, edited by Robert D Bullard, Sierra Club Books, 730 Polk St, San Franciso, CA 94109, 1994, \$25 (plus \$4.50 p&p) (hb), 392pp. ISBN 0-87156-450-5.

"The environmental justice movement is the confluence of three of America's greatest challenges," states one contributor to this wide-ranging volume of essays. She details these challenges, all examined in the book, as "the struggle against racism and poverty; the effort to preserve and improve the environment; and the compelling need to shift social institutions from class division and environmental depletion to social unity and global sustainability".

 ENVIRONMENTAL NGOS IN WORLD POLITICS: Linking the Local and the Global, by Thomas Princen and Matthias Finger, Routledge, London and New York, 1994, £14.99/\$16.95 (pb) 262pp. ISBN 0-415-11510-8.

The lobbying and educating activities of environmental non-governmental organizations at national and international levels have proliferated in the last decade. Analyzing NGO involvement in the ivory trade ban, the protection of Antarctica, the UNCED "Earth Summit" and the Great Lakes water quality agreement, the authors highlight the transformations — positive and negative — that NGOs have brought about at international conferences.

SEEDS OF HOPE: Local Initiatives in Thailand, by Sanitsuda Ekachai, Thai Development Support Committee, 409 3rd fl. TVS Bldg. Soi Rohitsook, Pracharat-bampen Road, Huay Khwang, Bangkok 10310, THAILAND, 1994, \$20 (plus p&p \$10 airmail; \$5 surface mail) (pb), 223pp. ISBN 974-89199-1-9.

This collection of articles and photographs from an award-winning *Bangkok Post* journalist describes rural and urban village life throughout Thailand, the economic hardship communities face due to the country's rapid modernization and development, and the myriad ways in which they adapt and extend local ways, embedded in particular cultures, to fashion their own future.

 CROP PHYSIOLOGY OF FIBRE (cannabis sativa L), by H van der Werf, Wageningen Agricultural University, 1994, 153pp, \$20. Available from International Hemp Association, Postbus 75007, Amsterdam 1070, THE NETHERLANDS.

In 1990, the Dutch government commissioned a £6 million, four-year study to investigate the potential contribution that paper made from domesticallygrown hemp could make towards protecting the world's forests and improving the land. This informative, down-to-earth volume is the result. The author concludes that hemp cultivation would represent a profitable alternative source of raw material to paper, over 90 per cent of which is currently made from wood.

Third World Tourism

Anita Pleumarom's article "The Political Economy of Tourism" (The Ecologist July/ August 1994) is a good documentation of issues that have been addressed by Third World tourism activists and networks worldwide for several years. Given the pace at which the international tourism industry is growing - especially in the socalled Third World (Asia and Pacific being the fastest growing regions) and the complex nature of issues involved, it is both timely and appropriate to give this issue cover page focus. I hope the debate will secure greater, diverse coverage in future issues. Nevertheless, there are several shortcomings in Pleumarom's articulation and effort to construct a political economy.

First, the article is primarily a discussion of some major issues related to tourism, rather than a historical delineation of the relations between power and capital, labour and land, modes of production and the creation of value, terms of trade, ideological content and cultural production, and so on -- fundamentals of political economy. As such, the title is both confusing and misleading. Tourism in the Third World (which is what the piece is about, rather than tourism in general, as suggested by the title) cannot be seen apart from colonial history, the era of mercantile capitalism, and the compulsions of global economies in the post-colonial era. Rather than being a model of development and a means of instilling modern values, tourism in the Third World is a logical and inevitable extension of the history of colonial trade and resource extraction.

Second, it is fallacious to imply that the industry — in its modern sense — has been created, almost, by the World Bank, Western governments and myriad other forces *external* to the so-called Third World, since political economy is as much about *inherent processes and choices* as it is about decisions imposed from without. It is fashionable in "progressive" circles today to describe the Third World as an unchanging, antediluvian, pristine "Self" frozen in time and space — pitted against the forces of Western capital, technology and "Other" evils. Such a construction is as Orientalist as that which it seeks to counter, and not very helpful in advancing the critique. It stands dangerously close to positions taken by right-wing reactionaries who reject all things Western and seek a revival of an imagined past.

Thus, Pleumarom's assertion that "many Third World governments responded positively . . . because [tourism] brought access to foreign currency . . . and enhanced prestige", whilst "in many cases they were offered 'tourism or nothing", does not hold water if we consider several cases (including those of India or Thailand) where tourism developed alongside, or was built upon, other economic sectors in the period of modernization. As such, she presents a limited view of the politics of tourism, applicable primarily to "island economies" of the Pacific and the Caribbean.

Third, her style of citing a wide array of examples - especially in the sections on eco-tourism - while testifying to her formidable documentation, has the limitation of skimming the surface, resulting in conclusions which are often implausible. Moreover, Costa Rica, Belize, Namibia, Botswana, Rwanda, Uganda, South Africa, Zimbabwe, Nepal - all good examples in their own right - cannot simply be homogenized and a theory constructed as if they were a lumpen mass: that is the preserve of the Orientalist. An example of her flawed analysis is the much cited ACAP project in Nepal. Although, as she points out, the project's economic aspects are questionable, the basic issues are those of the cultural politics of King Birendra's government. This has been discussed at length elsewhere, including in a previous issue of The Ecologist.

Fourth, I am amazed that the one truly well-known and widely documented example of peoples' action against tourism is not mentioned even in passing: that of the JGF (Jagrut Goenkaranchi Fauz or Vigilant Goans Army) in Goa. Not just because it is an example worth citing and has been an inspiration to countless others worldwide, but more because it is one of the very few cases of activism ideologically based on an understanding of the political economy of tourism. Similar cases from Hawai'i have been equally ignored. The author's case for a political economy is weakened by excluding insights from such crucial struggles. What she offers the reader instead — more accurately — is an illustration of (primarily) ecological abuses by investors and aid agencies, valuable information in itself, but hardly constituting a political economy.

Despite tangential references to protests or alternative actions in various parts of the world. Pleumarom makes no attempt to describe, much less evaluate critically, the activities of many groups and institutions around the world who have been involved in tourism issues for more than two decades: surprisingly so, since she has been an integral part of many of these for several years. They include the Ecumenical Coalition on Third World Tourism and several related networks and organizations, such as ANTENNA (Asian Tourism Action Network), GNAGA (Global Network for AntiGolf Action), TNT (Thai Network on Tourism) and GAG'M (Global Anti Golf Movement). Actions taken by these and other organizations have led to an increasing realisation worldwide of the abuses in tourism, and has resulted in some successes as well.

Perhaps it is to these she refers as "mainstream critics of tourism", if indeed such an identity is possible. While it can hardly be claimed that the existing body of Third World tourism critique and action is the be-all and end-all, an objective assessment of their actions and effectiveness would certainly contribute to Pleumarom's very valid assertion that "tourism alternatives must be part of a wider debate" towards a "new world order". By positing (and not distinguishing between) such discrete categories as "sustainable tourism advocates", "mainstream critics", "tourist or touristed", and finally, her chosen identity as an "independent researcher", she ironically ends up polarizing and fragmenting the very debate she seeks. The harsh reality is: if the desire for debate is not merely wishful, then we have to be open to others, not merely those who support our own persuasions. In an interdependent world, the notion of independence is fanciful to the extreme.

Given the preoccupation with issues within tourism — widely articulated elsewhere, it must be reiterated — there is little attention paid in the paper to possibilities open to those who are concerned and willing to act. The luxury of radical action (or radical thinking, even) is seldom available to those whose immediate concern is that of survival and meeting basic needs. An analysis of the JGF's evolution — since 1987 to the present — is instructive. Education and awareness building remain the keys. Negation is another strategy which has been attempted successfully, often including an alternative tourism. Not all action can be confrontational, nor indeed is it always appropriate and productive. Building a "new world order" is a worthy objective. but it cannot take place without engaging with what exists.

Finally, I find it remarkable that despite Pleumarom's repeated pleas for a local, people-articulated vision of development, the vast majority of her own 50-odd references are from Western sources, notwithstanding the rich availability of material on tourism today within the Third World. While I realise this has something to do with a notion of "academic quality", even among visionaries of a new paradigm, it does little to transform that vision into reality.

Paul Gonsalves

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Editors' Note

The title of Anita Pleumarom's article "The Political Economy of Tourism" was given by ourselves. We are grateful to Mr Gonsalves for pointing out our error.

Global Questions

"From Global to Local Thinking" by Gustavo Esteva and Madhu Suri Prakash (*The Ecologist*, September/October 1994) raises more questions than it answers. It is easy to agree about the need for pluralism and "thinking of the scale where we can understand and thus know and take care of the consequences of our actions". But it is not clear who Esteva and Prakash are criticizing until one reads the references in their full paper, where the "alternative global thinkers" they oppose are exemplified by the Worldwatch Institute, David Korten, James Robertson and Greenpeace.

However, Esteva and Prakash do not provide any evidence to show that these organizations and individuals are "pretending to know what is good for everyone" or producing global master plans and universal solutions to "manage planet earth". Where have they advocated the "global dissemination of ... basic amenities of modern life to every village on earth"? When did they argue that challenges to the present global order should be procrastinated until "equally gigantic transnational" alternative coalitions have been forged?

On the contrary, they are doing exactly what Esteva and Prakash advocate, namely strengthening the solidarity which "is now perhaps more needed than ever" by providing crucial information and linkages. That is why local activists worldwide make use of such organizations and events like The Other Economic Summit, co-founded by James Robertson.

It is an illusion that "all global powers . . may be effectively opposed through modest local action" - otherwise the world would be in a better state. The prime example of purely local thinking today is found in the boardrooms of transnational corporations where the focus is on the next quarterly profits irrespective of the wider consequences. The effects of this narrow perspective are now, thanks to GATT, imposed on every village. While it is often possible to de-link from eating imported food, it is not possible to de-link from the effects of another Chernobyl. Working for a global nuclear ban is, therefore, far from irrelevant to the marginalized majorities whose interest the authors claim to champion. To deny that we share a common destiny is to ignore the unique threat to life on earth which the environmental crisis represents.

Western individualism and "equality" has led to the rule of money. But the claim that individual rights are opposed (and not complementary) to communal obligations can only weaken solidarity and strengthen those despots who have as little regard for individual as they have for community rights.

As your Associate Editor Vandana Shiva has written, "Democratizing international interests is essential if democracy is to exist at the local and national level", (*The Ecologist*, November/ December 1992). I have attended many meetings where grassroots activists from South and North argue about how this is best achieved and also about which rights should be protected globally. I have never heard anyone claim that there are no such rights. Or is opposition to slavery simply a Western cultural prejudice?

Such debates need to continue. But we do not need a new alternative thought police determining when the good "transnational sharers" overstep the line to become the bad "globalists". I cannot believe that this is what Esteva and Prakash have in mind, But then they should chose their words more carefully for statements such as this one (from their full paper) have a totalitarian flavour: "The strength of the struggle . . . demands that there be no deviation from local inspiration and firmly rooted local thought".

Jakob von Uexkull The Right Livelihood Award 7 Park Crescent London WIN 3HE, UK

Global Participation

As a person who has committed my whole career to the holistic problems of futures research, I am one of the globalists who have been so roundly criticized in the recent editorial by Gustavo Esteva and Madu Suri Prakash ("From Global to Local Thinking", *The Ecologist*, September/ October 1994). It is extremely important for some of us to commit ourselves to a study of global forces and trends, to describe probable scenarios of future events and to explore alternative policies.

Such global thinking does not "twist the humble satisfaction of belonging to the cosmos into the arrogance of pretending to know what is good for everyone". If you call me arrogant for thinking for myself and for trying to find policies which will give the best future for ourselves, the planet and our descendants, you condemn me to ignorance and silence. That is an excellent way to preserve the dominance of the *de facto* world government of transnationals, World Bank, IMF and their friends.

It is wrong to suggest that "by framing local efforts within the context of global thinking . . . the issues become abstract, stripped of their content".

Let me give a contrary example. We face a concrete challenge locally in the Wairarapa, a farming area of New Zealand. The power company, Wairarapa Electricity, intends to build a dam, remove the water from 22 kilometres of river, and release it downstream in peak time pulses. It would cause much environmental damage and is uneconomic, as well as being a waste of money which could be better spent on energy conservation.

Some of us who are interested and active in global and national activities knew quite well what is going on. For decades, production has been greater than consumption for many goods. Private enterprise then searches for additional ways to invest capital and generate profit. One key way has been to take over public goods; what was once run by the community for its own good is then run by a few owners for their profit.

New Zealand has shared this trend with much of the developed world. The

government changed previous elected Power Boards into power companies, controlled by major shareholders. The rules of the game have changed completely. The privatized board must tell us the date of their Annual General Meeting (when shareholders are meant to have a say) just two weeks in advance. But nominations for directors, and notices of motion, must be filed much earlier - six weeks in advance. As a suspicious globalist, with a feeling for what was going on. I wrote and found out the date of the AGM, with just two days to spare. So we got in some motions and some nominations for director, and gathered lots of proxy votes from small shareholders.

As expected, we were slaughtered. The big shareholders voted down the motions and voted for the sitting directors — who had intended to sneak back in unopposed.

It is now obvious to everyone in the Wairarapa, just as it was obvious to us beforehand, that on a local level we are practically powerless. The rules have to be changed at the national level before the people can regain what they have lost. We cannot fight or overcome global forces "by acting, and thinking, locally".

The Green Party of New Zealand has realized this. We need a share of power in order to change even our local communities. The Greens are now partners with four other parties in an Alliance which is set to become one of the three dominant political parties in the next parliament, the first to be run under proportional representation.

Our participation is desperately needed. The new wave of unemployment described by Jeremy Rifkin (in the same issue of *The Ecologist*) for the US is getting under way here too. The reduction of manufacturing, the worsening of working conditions, the formation of an underclass are here just as in the US. For "African-Americans", just read "Maori", and the statistics of higher ethnic unemployment and other consequences of inequality are repeated.

The future is even more worrying. Having just completed a hopeful book, *Rebuilding New Zealand*, on policies which could take us away from selfishness into caring, I am preparing a very honest report on the probable events of the coming several decades. This forces me to bring together information from diverse sources and to consider historical precedents.

As so often happens, the research has taken over and the book is controlling the writer. I am forced into bleak pessimism we can expect a truly catastrophic 21st century. We must think and act on all possible levels if we are to prevent that scenario from becoming reality. National governments are important — that is the level at which sovereignty can be asserted to allow local input, and that is the level at which we can determine input into international forums.

Dr John Robinson

21 Oxford St Martinborough NEW ZEALAND

Cree Lands

I am writing to respond to the letter from Hydro Quebec published in your November/December 1994 issue.

The letter contains several examples of misinformation. It is an attempt to mollify your readers rather than inform them about the real impacts of the destructive mega-projects which are in the plans of Hydro Quebec for our lands in the James Bay Territory.

The letter pretends that Hydro Quebec's power serves Quebecers and not "power hungry" Americans and that the mega-projects are somehow therefore justified. In fact, the six million power hungry Quebecers are also a problem. New York State with three times the population of Quebec has the same installed capacity (over 30,000 mega watts) as Hydro Quebec.

Hydro Quebec says that it planned only to dam some of the rivers in James Bay in 1971 when it first announced the James Bay Project. It, in fact, announced the destruction of the ten largest rivers in our territory. The total reservoir area of the planned projects was to be over 25,000 square kilometres, larger than Northern Ireland.

In the letter, it is stated that Hydro Quebec relies primarily on energy efficiency programs to meet new demand. In fact, Hydro Quebec is today proceeding with the damming of the St Marguerite River, Lake Robertson and proceeding with the Eastmain River project planning. Hydro Quebec was only reluctantly drawn into energy efficiency programs when the bottom fell out of the American export market.

In addition to exports, Hydro Quebec sells electricity for under one half the cost of production to the aluminium industry. One such contract was contested under the Free Trade Agreement between Canada with the United States, and Hydro Quebec lost. The other 12 contracts are still secret. The terms of these are highly contentious in Quebec as they throw the cost of constructing the dams required to provide such electricity to the other Quebec rate payers. Hydro's claims for carbon replacement are largely contradicted by the greenhouse gases produced by the aluminium smelters.

Finally, the Hydro Quebec letter is most outrageous in its claims concerning the animals and about the impacts on my people, the Crees. The letter states that "mercury levels . . . are dropping guickly". leaving it unexplained whether they speak of mercury levels in the flesh of the fish in the reservoirs or in the people. In fact, Hydro Quebec's claims that the levels in the fish are dropping and will be in normal ranges within 30 years after flooding, are contradicted by work from the Fresh Water Institute which projects high levels for up to 100 years. As far as people are concerned, the Crees of Wemmindii, Eastmain and Chisasibi are afraid to eat the fish. We refer to mercury poisoning as "fish sickness" in our language. While there have not to my knowledge been instances of Minimata disease, it is still a question what the long-term exposure will do. It is moreover a problem because of the fear that this controversy has caused. The pike and predator fish in the reservoirs have enough mercury in them to be classified as toxic material. Moreover, the sturgeon in the reservoirs appear to be unable to survive and migrate upstream where they overpopulate as yet untouched areas.

The letter states that the number of caribou has gone up from 200,000 to 700,000 since 1975. In fact, the techniques for counting the herd have a 40 per cent margin of error so these figures are to be treated with caution. The folly of the letter was to state that the "vastness of the frozen reservoirs provides them security from predators". Can you imagine hundreds of thousands of caribou standing on the reservoirs with the wolves circling? What would the caribou eat? Caribou moss does not grow on reservoirs.

In fact, the caribou are largely located to the north of the La Grande Project south of Ungava Bay and in the upper reaches of the Great and Little Whale Rivers. The Cree elders say that the herd goes through large population swings every couple of centuries. They say that the caribou have been disturbed in their usual migration route by the reservoirs.

Nobody, including Hydro Quebec, knows the reasons for these increases in the caribou population. The frightening thing is that without really understanding

this. Hydro Quebec was ready to go ahead with the Great Whale River Project until it was put on hold last year by the Premier for political reasons.

The letter claims that such projects have to be reviewed and that "all information must be submitted to the government before any development is approved". The reality is that Quebec wanted a closed door review of the projects and did not want Canada to undertake a review of matters under its jurisdiction (marine mammals, fish, navigable waters, aboriginal peoples) until it was ordered by the courts to allow such a review.

After over \$300 million of studies on design and environment, the report produced by Hydro Quebec was judged to be incomplete by the panels, committee and Commission that reviewed it. However, the present Minister of the Environment criticized, in turn, the report of the panels, calling it "an inquisition".

Our fear now is that the forces within the Quebec government who want the project will find a way to build it. The Premier, Mr Parizeau, has said that the project is frozen until the result of the "Public Debate on Energy" is known. This debate has, however, been set up to include Hydro Quebec on the panel to judge Quebec energy options. The fox is now in charge of the chickens. This means that the technical input to the debate will be largely done by those with an interest in building the next megaproject. The debate process does not allow for any significant independent technical resources to be put together to counterbalance this influence. For these reasons, the Quebec environmental groups are boycotting the process.

If we are to continue to protect our way of life and our lands, we must have public support for our efforts. To date, we have been successful in protecting our language and life on the land, not because of the mega-projects but in spite of them. The reason that there was any agreement

Since then, we have learned some lessons. The diversion of large rivers and flooding on a vast scale are not compatible with our traditions. If development is to come, it must be on a more modest scale which preserves the integrity of the environment and includes the Cree people as owners, partners and coworkers in the management of our lands and resources. Grand Chief Matthew Coon Como

on the first phase of development was

because we fought against the govern-

ment of Quebec who had proceeded with

the project without even speaking to us.

Grand Council of the Crees (of Quebec) Embassy of the Cree Nation 24 Bayswater Avenue Ottawa Ontario K1Y 2E4 CANADA

Carbon Pulse

I am writing to correct an error that crept into the abstract of my article "Finger on the Carbon Pulse: Climate Change and the Boreal Forests" (The Ecologist, November/December 1994). The article should not say that from 50 to 90 per cent of the boreal forest will decline "within the next 30-50 years".

Over the next 30-50 years, greenhouse gas levels are projected to double in the earth's atmosphere. This is likely to cause an abrupt and catastrophic climate change that will, over a period of time, cause the decline of most of the existing boreal forest. The rate of decline will vary considerably, depending on local climatic conditions. In drier areas, climate change would dramatically increase the frequency and extent of fires and insect outbreaks causing rapid decline.

In many other areas, boreal species will fail to reproduce because of temperature and reproductive stress, and will

eventually be replaced by temperate species like maple and oak. This will be a gradual process that could take several centuries. This process is being rapidly accelerated, however, by clearcut logging, which removes forest over wide areas, allowing the invasion of temperate species much more quickly than would other wise occur.

One crucial factor controlling the rate of forest decline is the "carbon pulse" - the large release of carbon from peatlands, soils and dving vegetation expected as the climate changes. The boreal forest contains as much carbon as the earth's atmosphere. If a significant portion of boreal carbon is released into the atmosphere, the rate of climate change and forest decline could be much more rapid.

There is strong evidence that this decline has already begun. 1994, for example, was globally the fourth warmest year ever recorded, sparking fires that burned over five million hectares of forest in Canada alone — an area larger than The Netherlands.

Kevin Jardine Greenpeace Canada 185 Spadina Avenue Toronto Ontario M5T 2C5 CANADA

Correction

The photograph which appeared on page 133 of The Ecologist, Vol 24, No 4, July/ August 1994 in the article "Living Under Contract: The Social Impacts of Contract Farming in West Africa" by Michael J Watts was mistakenly credited. The photograph was taken by Dr David Gamble in the course of his field research in The Gamiba. We apologize for any inconvenience this may have caused.

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27-29 April 1995: International Conference on EN-VIRONMENTAL ETHICS & THE GLOBAL MARKETPLACE to explore sustainable business practices that work in harmony with the environment instead of at its expense. For more information, contact: Margaret Caufield, Conference Coordinator, the Georgia Center for Continuing Education, University of Georgia, Athens, Georgia 30602-3603, USA. Tel: +1 (706) 542 1585; Fax: +1 (706) 542 6596; e-mail: mcaufield@gacsrv.gactr.uga.edu

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