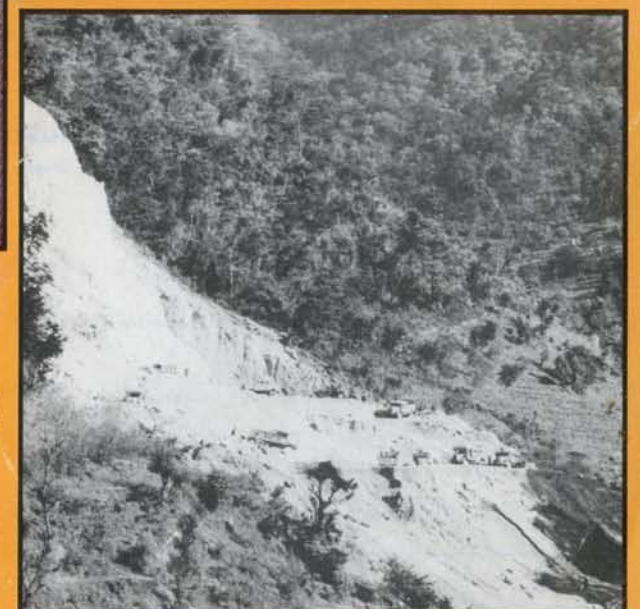
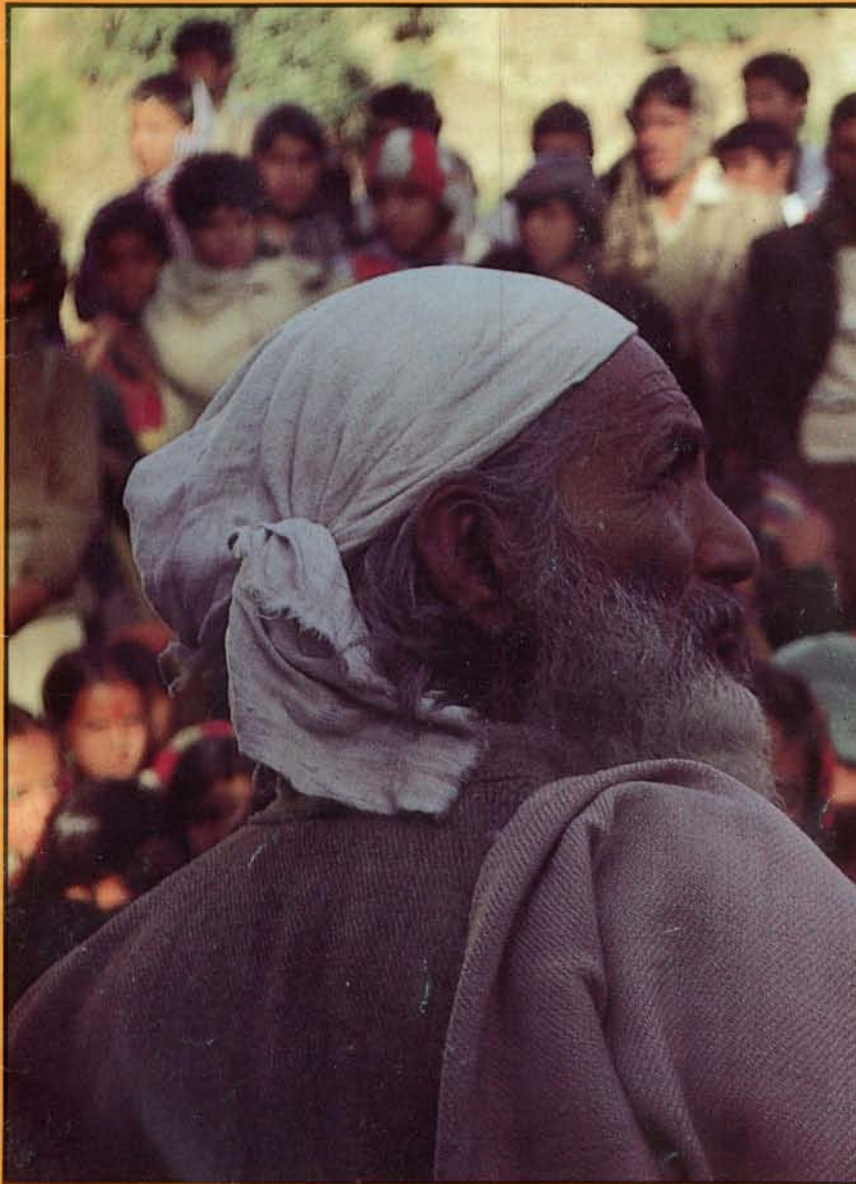


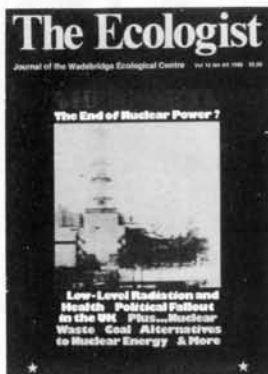
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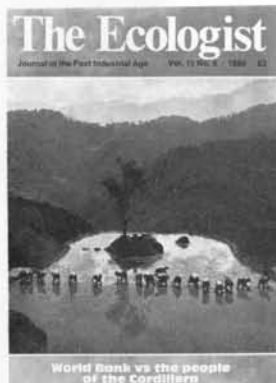


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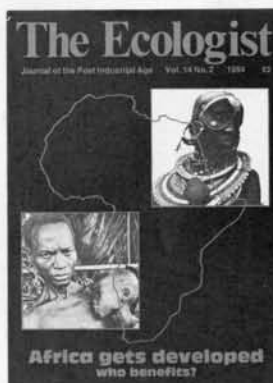
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Cover: Sunderlal Bahuguna, one of the Chipko Movement's best known activists, addresses a tree planting ceremony in Tehri-Garhwal. (Photo: Anne Hildyard) Lay-Out: John McIntyre.

Errata

The Ecologist, Vol. 16, No. 6, 1986. In M. Diesendorf and P. Sutton's article, *Fluoride: New Grounds for Concern*: on p.240, column 2, 7th line from bottom should read "the minimum safety factor is 10 for"; on p.242, column 2, last two lines should read "promoters, not on the basis of a detailed study of the issue".

Obituary

The Ecologist was shocked to learn of the death of D. Rajendran, Secretary of Sahabat Alam Malaysia (SAM). As a tribute to him we publish the following obituary.

One of the pioneers of Sahabat Alam Malaysia, Mr D Rajendran passed away peacefully on Dec 9 last year after a long battle with multiple myeloma, an ailment affecting the bone marrow.

Rajendran as he was affectionately called was the Secretary of SAM and the head of the Rural Community section in the Consumers' Association of Penang (CAP). At the time of his death, he was only 33 years old.

Rajendran began his career in CAP in 1976 after graduating with a Bachelor of Science degree. When SAM was newly formed in 1978, he was elected Secretary and was responsible for its day to day functioning.

In 1976, while he was working in CAP, Rajendran was one of those responsible for highlighting the pollution problem at the Kuala Juru fishing village in Seberang Prai. This became the first major grass-roots environmental issue in Malaysia.

During SAM's humble beginnings in Kelawai Road, Penang, Rajendran toiled day and night. He helped to organise dozens of grassroots and farming communities affected by pollution and other environmental problems. He also helped to tackle problems such as air and dust pollution caused by factories and unhealthy disposal of toxic wastes.

Under Rajendran's tireless organisational direction, SAM conducted studies on a wide range of environmental issues, including soil erosion, depletion of fishery resources, air and noise pollution and occupational safety. These studies sent as reports and memoranda to the government, had an impact on subsequent public policy.

But his work was always never ending.

There was so much to be done.

Fellow colleagues used to remark: "Rajendran used to work late into the night and sometimes into the wee hours of the morning. If he wanted to sleep, he would neatly put away all the files and papers on his table, spread out his mattress on it and fall asleep."

His home was his office and his cause was for the oppressed.

Rajendran also greatly contributed to the formation of various national and international networks such as the national fishermen's network, the network for workers' education on occupational safety and the Asian People's Pacific Environment Network (APPEN).

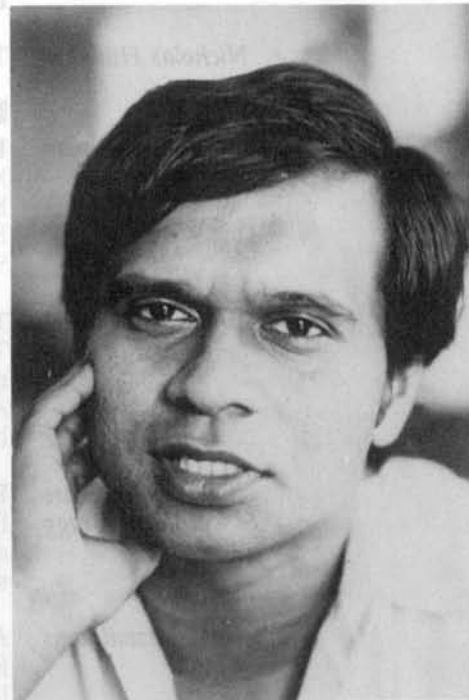
Rajendran knew that he was suffering from multiple myeloma four years ago, but that never deterred him from fighting for the people. He never resigned from life to accept his fate but instead told himself that he had little time to complete what he had started. That kept him going till the end.

He kept the excruciating pain to himself and suffered in silence and at the same time kept up a bold front. He still met people.

Fishermen, padi-farmers, estate workers, and vegetable farmers always found him accessible. If he couldn't meet them because he was sick, he would ask them over at the office at night, when he was a bit better. He never turned anyone away.

Even in his last days in a hospital bed at the Cancer Ward in the Kuala Lumpur General Hospital, he was meeting his staff to conduct meetings and discussions.

There was work to be done. If one didn't act fast enough, a poor farmer might have his plot of land bulldozed by a housing



developer, a squatter's house might be torn down and his family would have to spend the night out in the cold, an indigenous community in the forests might be forced to move out of their land...

Rajendran gave his best for mankind even at his final moments. He will live in our hearts forever and his cause for the human race will spur and inspire us on to new horizons.

Published in *Suara Sam*, 3, 1987.

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It describes the traditional social and economic system of swidden agriculture, and how their forest resources and way of life are increasingly threatened by the forces of 'modernisation'.

Focus is given on how the natives' customary lands are being encroached upon by the timber industry and development projects such as the construction of large dams. Included are oral testi-

monies from several native communities about their plight.

The book also analyses the social and environmental impact of logging activities, and provides suggestions on what can be done to resolve the natives' problems.

This book is essential reading for those interested in Sarawak, and its natives, the fate of the tropical forests and the rights of indigenous peoples in the Third World.

Available from *The Ecologist*, Worthyvale Manor Farm, Camel-ford, Cornwall PL32 2TT, United Kingdom.

The Basel Disaster and Proposition 65

1986 saw two international pollution disasters: in late April, Chernobyl brought home the catastrophic dangers of nuclear power; six months later, at the end of October, a fire at the Sandoz chemical warehouse on the outskirts of Basel effectively rendered a 75-mile stretch of the Rhine lifeless. The lessons of Chernobyl have already been clearly spelled out in *The Ecologist* (July 1986) when we called for an end to the nuclear industry: those of 'Chernobâlê' (as the French, using their spelling of 'Basel', dubbed the Rhine disaster) are no less far reaching. Indeed, if our rivers and groundwaters are to be protected from future Basels, then the changes required in society will be far more profound than those dictated by the phasing out of nuclear power—if only because highly toxic chemicals play a far greater role in our lives than nuclear energy.

The Accident

The Sandoz fire broke out on the night of October 31st, apparently as a result of 'animals' (the company did not specify what species) gnawing away at electrical wiring. Over thirty different agricultural chemicals were stored in the warehouse, including 25 tonnes of the insecticide Parathion (banned in many countries and classified by the World Health Organisation as 'highly toxic'), 12 tonnes of the mercury-based fungicide Tillex, 10 tonnes of the insecticide Fenithrothion (implicated as a cause of Reye's Syndrome in children), and 323 tonnes of the insecticide Disulfeton (judged to be twice as toxic to rats as potassium cyanide). Up to 30 tonnes of these and other pesticides, fungicides and colourants were washed into the Rhine by the water hosed onto the warehouse in an attempt to put out the blaze.

Experts are agreed that the accident could have been even worse. Drums of chemicals and other debris blasted into the air by the explosions in the burning warehouse quickly holed the roof of an adjacent building, where drums of sodium were being stored. As firemen played their hoses onto the building in order to prevent the main fire from spreading, the drums were doused in water. Had that water come into contact with any of the sodium—due to a ruptured drum, for example—the result would have been an almighty explosion which could have blown apart nearby storage tanks containing the nerve gas, phosgene. If that had happened, then, in the words of one local MP, the result would have been a chemical catastrophe which "would have put Bhopal in the shade".

No sooner had the blaze at Sandoz been put out than scientists monitoring the progress of the slick as it passed through West Germany announced that they had detected high concentrations of the herbicide Atrazine—a chemical which was not listed as stored in the Sandoz warehouse. Only later did the chemical giant Ciba-Geigy admit that it too had suffered a major spill—purportedly the day before the Sandoz accident—which, according to the company, resulted in the release of 100 gallons of Atrazine into the Rhine. Those who suspected that Ciba-Geigy had cynically exploited the Sandoz accident to get rid of unwanted wastes were hardly assuaged when West German officials estimated the release to have been 15 times greater than the company claimed.

The Ecological Effects

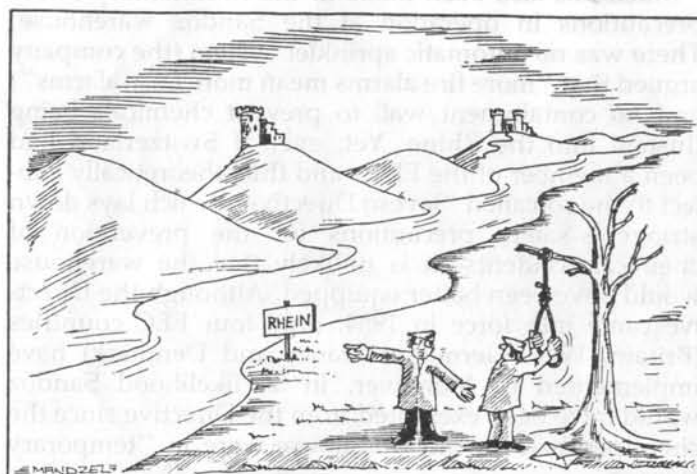
In just two hours, the Sandoz fire released more pollutants into the Rhine than the river normally receives within a year. The effect of the spill on aquatic life was (and will remain) cataclysmic. For 200 kilometres downstream of the Sandoz warehouse, the Rhine is now more or less 'lifeless'. Aquatic chemists and biologists fear that it will be at least ten years before the river recovers—and that some stretches may never do so. It is estimated that some 500,000 fish were killed outright by the spill: many of those that survived are likely to be heavily contaminated by mercury, 200 kilograms of which were released during the fire. Even normally hardy species, such as eels, were killed in their hundreds of thousands, *Newsweek* reporting that "the few found alive had bulging eyes and ugly sores".

Nor were fish and eels the only species to be affected: for a long stretch downstream of Basel, everything from worms to snails, shrimps, water fleas, larvae and plankton were decimated, thus drastically reducing the food supply available to those few organisms which survived. The impact of the disaster on bird life is as yet unknown, but is likely to be severe, both for those species which live habitually on the Rhine and those which over-winter there. With Disulfeton levels still registering 2 ppm at the mouth of the river—some 600 kilometres downstream of the accident—it is feared that the spill will wreck havoc with wildlife in the Wadden Sea, itself already badly polluted by PCBs and other chemicals.

For those living in the Rhine watershed, the accident brought more than polluted fish. The chief threat lay in polluted drinking water—a threat that has not gone away with the passing of the toxic slick. Although water supplies have now been restored to those villages and towns cut off for public health reasons during the disaster, the danger of pollution persists. Scientists fear that the chemicals may have permeated through the river bed of the Rhine into underlying groundwaters. If that is so, then water supplies in the Rhine Basin may be polluted for years to come.

Flouting the Law

Four years ago, the International Water Tribunal (IWT), a group set up in 1981 by a coalition of Dutch



Cartoon: Deutsches Allgemeines Sonntagsblatt/
Waldemar H. Mandel

environmentalists, conducted an ecological survey of the entire length of the Rhine. As a result of that survey, the IWT was able to pinpoint a number of discharge pipes which were apparently operating in contravention of their discharge permits. All told, 45 companies were accused by IWT of causing pollution. Since then, stiffer pollution controls have been introduced for several industries. But, as events following the Sandoz disaster make clear, non-compliance is still the rule rather than the exception. Company after company has now been found exceeding its discharge permits. Within a month of the Sandoz fire, 12 major pollution incidents had been reported. First there was Ciba-Geigy; then a 1100 kilograms of the herbicide dichloro-phenoxyacetic acid were spilled from a BASF plant in Ludwigshafen; then a Hoechst plant on the Main, a tributary of the Rhine, owned up to a major leak of the solvent chlorobenzol; then Lonza admitted to 1000 gallons of PVC-contaminated liquor escaping from its factory near Waldshut. Indeed, accidents are apparently so commonplace on the Rhine that the Basel authorities dismissed the Ciba-Geigy incident as "a bagatelle", adding that "the emission of substances used for agrochemical production into the Rhine happens frequently". According to Greenpeace, the Ciba-Geigy plant had been discharging high levels of Atrazine into the Rhine for over a year.

That is not to suggest that the pollution of the Rhine results solely from illegal discharges. Far from it. Even before the Sandoz disaster, the Rhine was little more than an open chemical sewer—polluted not by catastrophic accidents but by perfectly legal everyday discharges. Indeed, a 1980 survey, conducted where the Rhine crosses the German border into Holland, found that the river carried an annual load of some 16 tonnes of mercury, 322 tonnes of arsenic, 80 tonnes of cadmium, 1200 tonnes of lead, 400 tonnes of phenols, 3 tonnes of hexachlorobenzene and 20 tonnes of PCBs. Despite stricter pollution controls, a recent report from the West German Research Ministry reveals that the Rhine is only slightly less polluted than in the 1970s—suggesting at the very least that current controls are quite inadequate. According to the report, the only pollutant to have declined significantly is DDT. The scientists who compiled the report argue that "if the level of pollution continues unchanged and the cumulative burden thereby continues to rise . . . irreparable damage to entire North Sea ecosystems may be inevitable." There is no hope, however, of achieving any clean-up so long as industry is allowed to flout discharge permits with apparent impunity.

Much has also been made of the rudimentary safety precautions in operation at the Sandoz warehouse. There was no automatic sprinkler system (the company argued that "more fire alarms mean more false alarms") and no containment wall to prevent chemicals being flushed into the Rhine. Yet, even if Switzerland had been a member of the EEC—and thus theoretically subject to the so-called 'Seveso Directive', which lays down stringent safety precautions for the prevention of chemical accidents—it is unlikely that the warehouse would have been better equipped. Although the Directive came into force in 1984, only four EEC countries (Britain, West Germany, France and Denmark) have implemented it. Moreover, in all likelihood Sandoz would have been exempted from the Directive since the chemicals held in the warehouse were in "temporary storage".

The Lessons of Sandoz

But the lessons of Sandoz go beyond the need for stricter controls and better enforcement. The fact that a single chemical spill can destroy aquatic life over some 200 kilometres, nullify ten years of effort in cleaning up a river, and possibly pollute the groundwaters that supply drinking water to millions of people, surely brings into question the wisdom of allowing dangerous chemicals to be stored or produced *anywhere* near watercourses or sources of drinking water. However well designed a plant, there is always something that can go wrong—wires that can be chewed through, or switches that can be tripped in error—and, as Murphy's Law reminds us, "If something can go wrong, it will".

Accidents are inevitable—and that reality makes a nonsense of the whole thrust of current pollution controls. Present regulations are based on the assumption that industrial discharges into rivers are perfectly acceptable provided that they are kept within certain limits, the rationale being that the wastes are quickly diluted to safe levels by the receiving water. Quite apart from the dubious validity of that assumption—dilution does not prevent the bioconcentration of wastes in the food chain, nor sublethal damage to aquatic life—such a policy can only mean that lethal chemicals are brought into close proximity with watercourses. Come the inevitable accident and the result is a major pollution disaster. If therefore we wish to prevent another Basel, then the very first step is to introduce legislation which will force industry to move away from rivers and other watercourses, thus stopping water pollution before it even begins.

Such a policy—albeit in a limited form—has now been introduced in California under a new law known as Proposition 65. Passed by two-to-one majority in a state referendum, the Proposition requires the Governor of California to publish a list of chemicals which are known to cause cancer or birth defects. Under the new legislation, it will become illegal knowingly to allow 'significant' amounts of any of the listed chemicals into any source of drinking water. Not only will ordinary citizens have the right to sue companies which they suspect of infringing the new regulations but, in sharp contrast to previous legislation, it will be up to the accused companies to prove their innocence. The burden of proof has thus been shifted dramatically.

The implications of Proposition 65 for the siting of factories and waste disposal facilities are far-reaching. In particular, the new law will force industrial plants away from watercourses and hasten the end of landfill as a means of waste disposal. Hopefully, it will also promote the adoption of 'low-waste' production processes and encourage companies to cease producing those chemicals which are either proven or suspect carcinogens or teratogens. Environmentalists and consumer groups are now hoping to enact similar legislation in other states.

Proposition 65 is not a panacea to the problems of industrial pollution. But it is a small first step towards putting an end to future Chernobîles. European environmental groups would do well to push the European Parliament to adopt similar legislation—and to ensure that it is enforced. It must be made abundantly clear to our legislators that we do not wish any carcinogenic or teratogenic or toxic chemical produced or stored—in any quantities—near any water supply.

Nicholas Hildyard



Photo: Associated Press

"For key members of the Reagan Administration, Armageddon is the basis of policy."

Reagan, God and the Bomb

by F.H. Knelman

In the USA, many fundamentalist Christians are convinced that a nuclear Apocalypse is part of God's divine plan for Mankind—the Armageddon which will usher in the Second Coming of Christ. True Christians will be saved from the nuclear holocaust by being spirited to safety in Heaven. President Reagan, who owes much to the Religious Right for his election and re-election, has stated that he himself "sometimes believes we're heading very fast for Armageddon". His Secretary of State for Defence, Caspar Weinberger, is a 'born-again' Christian. Could a nuclear war be triggered because the Reagan administration confuses an Act of Man for an Act of God?

The strange amalgam of forces that brought and returned Ronald Reagan to power has been referred to collectively as the 'New Right'. Its membership ranges widely, from a small group of influential security intellectuals, to veterans of the Old Right, to the Moral Majority of the fundamentalist evangelicals or 'electronic pastors'. This latter group has played a particularly crucial role in the political actions of the New Right. Their literal and often liberal interpretation of the Bible, coupled to a blind and absolute belief in the Word, has profound implications for the likelihood of an all-out nuclear war.

Reagan is not the first president to claim God as his personal and national ally: but he is probably the first president openly to write religion into politics and to cater to religious fanatics. The Reagan cosmology, with its utter simplicity and depth of belief—uncluttered by any rational process of judgement, never confused by the facts, never obliged to follow the dictates of evidence—incorporates the more dangerous characteristics of the apostles of the New Right. The politics of the sophisticated "Wizards of Armageddon" merge with the world view of the fundamentalist true believers, with whom Reagan supporters share a commitment to destroying the 'Evil Empire', if necessary through the battle of the 'Final Days' on this earth. This binding commitment is strong enough to overcome the internal political differences within the New Right, and to create a hard-line, undifferentiated, ultra-conservative perception of the Soviet threat.

*Professor F.H. Knelman teaches at the Department of Science and Human Affairs, Concordia University, Montreal. He is the author of **Reagan, God and the Bomb**, from which this article is extracted. The book is published by Prometheus Books, 700 East Amherst Street, Buffalo, New York, 14215, USA.*

"If we have to start all over again with Adam and Eve, then I want them to be Americans and not Russians, and I want them on this continent, not in Europe."

Senator Richard Russell

Religion and Nuclear War

The position which US fundamentalist/born-again religious organisations have taken on nuclear war stands in stark contrast to that of other churches in the West. In the vanguard of peace, the World Council of Churches and the Catholic Church have both condemned nuclear war. The Lutheran Churches of the Netherlands and the two Germanys have also played a prominent role in the peace movement. Many groups and individuals in the Third World have shown their concern and become part of the global peace network. Some Third World leaders, such as Gandhi and Nyerere, have gained prominence in the search for justice and peace. In the US Roman Catholic bishops have taken a surprising, courageous and incisive position and have spoken out against nuclear war with vigour and clarity. This provides hope that moral vitality still persists in American life. It stands in sharp contrast to the moral position of the Moral Majority and their electronic churches.

God on Our Side

There is little precedent for the direct association of religion and politics in the US, the separation of church and state being written into the Constitution. But, presidents from Truman to Reagan have invoked God, good, and evil in the name of the USA's "mission" to be superior in nuclear arms, remain superior, and, if necessary, fight and win a nuclear war. Even Richard Nixon said in 1980, "It may seem melodramatic to say that the US and Russia represent Good and Evil, Light and Darkness, God and the Devil. But if we think of it that way, it helps to clarify our perspective of the world struggle."¹

Nixon's statement indicates his pragmatism. But in the voices of Ronald Reagan, Caspar Weinberger, and the unholy alliance of the New Right, any hint of pragmatism or politics disappears, drowned out by the shrill, clear voices of the true believers, the nuclear holy crusaders. Nuclear armament is linked to moral rearmament and crusades for a holy Christian war against "godless communism," Reagan's favourite phrase. They have buttressed their preaching with plans for a huge arms build-up to fight and win any nuclear war or to destroy Soviet communism by blackmail, coercion, or economic suffocation. The danger lies in the sincerity of their belief. When Reagan said, "It is time for us to start a (military) build-up and it is time for us to build to the point that no against us, and in this way we will preserve the peace",² he really meant it.

God vs The Evil Empire

When Reagan spoke at the National Association of Evangelicals in Orlando, Florida, he deliberately linked the belief in God to opposition to a nuclear freeze, and to support of a massive build-up in US arms. As he put it, "There is sin and evil in the world and we are enjoined by Scripture and the Lord Jesus to oppose it, should deterrence fail." He went on to say, "Soviet communism is the force of evil in the modern world . . . (they) possess the aggressive instincts of an evil empire."³ Lewis comments, "But it is not funny. What is the world to think when the greatest of powers is led by a man who applies to the most difficult human problem a simplistic theology, one in fact rejected by most theologians?" Can the concept of good and evil be applied "to the contentious technical particulars of arms programmes . . . or whether 10,000 nuclear warheads are enough, whether the United States needs a first-strike weapon against the Soviet Union . . . (or) whether a nuclear freeze is likely to make the world more or less safe"?

To be fair, the US has long rejected deterrence in favour of a "warfighting" doctrine. At various times, Robert McNamara, James Schlesinger, Donald Rumsfeld, and Harold Brown preferred the "strategic doctrine" of a limited nuclear war. Former President Jimmy Carter gave this doctrine substance in his presidential directive PD-59. Harold Brown, secretary of defence under Carter, used the expression "countervailing" strategy, which really meant that the US must develop the capacity to "prevail" at any level of escalation in a nuclear conflict. Supporters of Brown's strategy argued that it had merit for deterrence, although the more sane, in their moments of candour, expressed doubt that a nuclear war could be "surgically controlled." No such doubts cloud the official policy of the Reagan administration. Armed with the primitive belief that God is not only on their side but also guiding their mission, they have developed policies and plans to fight and win a limited, protracted, or all-out nuclear war.

Armageddon and the Bomb

In its most frightening aspect, the Reagan administration couples its warfighting policy with a fundamentalist, religious world view. The end of the world is engrained in the minds of the reborn. Armageddon is not a mere tenuous prophecy, but an absolute prediction. For key members of the administration, Armageddon is the basis of policy. In a radio interview on "Washington Talk" on 23 August 1982, Defence Secretary Caspar Weinberger was asked if he believed the world was going to end and, if so, "Will it be by an act of God or an act of man?" Weinberger replied, "I have read the book of Revelation and, yes, I believe the world is going to end—by an act of God, I hope . . . I worry that we will not have time to get strong enough . . . I fear we will not be ready. I think time is running out . . . but I have faith."⁴ Former Interior Secretary James Watt stands on record with the same belief and thus his policies were designed to make the environment expendable.

One hundred religious leaders have accused the Reagan administration of taking the position that "reconciliation with America's adversaries is ultimately futile."⁵

At a conference of religious leaders in the Washington Hotel on 23 October 1984, the Christie Institute claimed to have collected eleven statements by Reagan that suggested the imminence of Armageddon. In the second Mondale-Reagan debate, Reagan characteristically brushed this charge aside, but Rabbi Brickner claimed Mr Reagan had "talked about it (Armageddon) in a serious, frightening way." The internal logic is terrifying; if the world is going to end and if God is on your side, then "an act of man" becomes "an act of God."

In the USSR, one can find a mirror-image rhetoric that replaces God with communism and a mirror-image paranoia about the US. However, the USSR leaders declared a "no first-use" commitment on 15 June 1982.⁶

The "Final Days"

The current fundamentalist theology of Armageddon is convoluted and complicated. The "born-again" group expressly believes that at present the world is in an age of satanic control (the "evil empire"). Shortly, Soviet, European, Iranian, Arabian, African, and Chinese armies will invade Israel and be totally destroyed, possibly by a nuclear war. A remnant of Israelites will be saved to accept Jesus as their messiah. Christ and an army of saints will then return to earth to punish the unbelievers and destroy the forces of anti-Christ in the "big one", the battle of Armageddon. We have already seen how Caspar Weinberger believes in the "end of the world".⁷ Reagan has been quoted as saying: "Never has there been a time in which so many (biblical) prophecies are coming together. There have been times in the past when people thought the end of the world was coming, and so forth, but never anything like this"⁸; and "Jerry, I sometimes believe we're heading very fast for Armageddon".⁹

Jerry Falwell, head of the Moral Majority, predicted the Russians would have come from across the Mexican border by 1981, "if Reagan had not been elected in 1980".¹⁰ In an interview with Robert Scheer, in the *Los Angeles Times*, Falwell stated: "We believe that Russia, because of her need of oil—and she's running out now—is going to move in on the Middle East, and particularly Israel, because of their hatred of the Jew, and that it is at that time that all hell will break out. And it is at that time when I believe there will be some nuclear holocaust on this earth".¹¹

The "exact" prophecy of the Bible tells the fundamentalists that their God, who created a fully equipped, fully inhabited universe exactly 5,988 years ago, is about to bring it to an end. Independent fundamentalist ministries such as Second Coming Incorporated produce an unappetising array of television productions and magazine publications—*It's Happening Now*, *Bible Prophecy News*, and the *Endtime Messenger*—that prophesy the final days. Hal Lindsey's book *The Late Great Planet Earth* has sold over fifteen million copies and won him the title of *New York Times*'s bestselling nonfiction writer. Falwell's television specials, his booklet *Nuclear War and the Second Coming of Jesus Christ*, and his book *Armageddon and the Coming War with Russia* have sold millions, and give the lie to Falwell's later attempts to deny that he associated nuclear war and religious prophecy.¹² In effect, he has marketed the end of the world.

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Photo: Associated Press

The Reverend Jerry Falwell, founder of the Moral Majority movement. Four hundred television stations and 500 radio stations across North America transmit Falwell's "Old Time Gospel Hour" once a week. Among his publications are: *Nuclear War and the Coming of Jesus Christ* and *Armageddon and the Coming War with Russia*. The titles are indicative of his views on the "Final Days".

Today, according to the fundamentalists, the world has approached the end of the "Church Age", epitomised by the rise to power of Reaganism, and the signs of the beginning of the "Tribulation" period have begun to appear everywhere: the rise of feminism, the sexual revolution, the divorce rate, legalised abortion, the absence of school prayer, herpes, AIDS, and, most of all, communism. This Armageddon doctrine "seems to justify nuclear war as a divine instrument to punish the wicked and complete God's plan for history . . . In the Armageddon world view, this final era (the battle of Armageddon) is foretold in Holy Scripture, constitutes God's plan for humanity, and cannot be prevented."¹³

Rapture: Saving the Elect

Fundamentalists believe that they will survive the coming Holocaust through a concept termed the "Rapture". The development of this notion began in Scotland, after a young Glaswegian woman claimed to have had a "vision". Darbyites, members of a Scottish fundamentalist Protestant group, produced the major version of the Rapture in the Scofield Reference Bible in the 1820s. According to Scofield, exactly seven years before the final battle, the period of "Tribulation" begins. During the Tribulation, God will take "true Christians" bodily away from earth and into heaven.

Many cultures and religions share an "end of the world" notion. The Koran refers to it: "Have faith in Allah and the Last Day—these shall be rewarded" (*Koran* 4:60). The Bible says, "Gather yourselves together, that I may tell you that which shall befall you in the last days" (*Gen.* 49:1); and "This know also, that in the last days perilous times shall come" (*2 Tim.* 3:1). The Rapture is not in the Bible, but Jerry Falwell actually distributes a bumper sticker with the words, "If the driver disappears, grab the wheel!"

The Rapture allows Falwell to say in one of his cassette tape sets: "Hey! It's great being a Christian. We have a wonderful future ahead . . . So we don't need to go to bed at night wondering if someone's going to push the button between now and sunrise." In April 1983, Falwell informed his followers, "Well, nuclear war and the Second Coming of Christ, Armageddon and the Coming war with Russia, what does this have to do and say to me? . . . None of this should bring fear to your hearts, because we are all going up in the Rapture before any of it occurs."¹⁴

Jerry Falwell, Ronald Reagan, Caspar Weinberger, and the rest of the "good" will suddenly vanish; The Soviets will invade Israel; and wood will replace metal through a superadvanced technology of instant transmutation. How could the Bible be wrong! According to Writ, Russia will lose exactly 83 per cent of her soldiers and then be repulsed. The remaining seven years of Tribulation will be occupied entirely with burying Soviet soldiers and burning wooden shafts.

Next, according to Falwell, "the Antichrist will move into the Middle East, place a statue of himself in the Jewish temple holy of holies and demand that the whole world worship him as God."¹⁵ The "nonraptured" world—all Jews, Mohammedans, Hindus, atheists, primitives, homosexuals, feminists, pro-abortionists, communists, etc.—will flock to worship anti-Christ. Then the "hero" (Ronald Reagan) will return and, in a nuclear duel in which Armageddon, a city near Jerusalem, becomes ground zero, he will destroy all the followers of anti-Christ. At the Second Coming, Jesus, floating on a white (mushroom-shaped?) cloud, will return to bring the Millenium. After one thousand years of a world of Falwell, Reagan, and Weinberger clones, eternity brings "eternal bliss and joy for those in Heaven, eternal suffering and torment for those in hell,"—that is, non-Christians, homosexuals, feminists, communists, etc.

Is Reagan a Believer?

The crux of this issue is whether the most powerful man in the world, the president of the United States, Ronald Reagan, believes all this. Falwell told Robert Scheer of the *Los Angeles Times* in March 1981 that he and Reagan have discussed biblical prophecy and "that Reagan agrees with him."¹⁶ Reagan led the battle to return prayer to the schools and declared 1983 to be "The Year of the Bible." He has addressed the National Religious Broadcasters convention during each year of his presidency. Reagan invited Jerry Falwell to a private briefing by the National Security Council. Ronald Goodwin, Falwell's second-in-command, wrote to their followers, "He (Falwell) met with President Reagan in the White House and the President personally instructed

him to thank every member of the Moral Majority for defending the President's programme to save America from Soviet nuclear blackmail".¹⁷

But Reagan has even more direct linkages with the Moral Majority. Morton Blackwell, special assistant to the president in the Office of Public Liaison, and Paul Weyrich, of the Heritage Foundation, masterminded the successful fundraising campaigns for Reagan sponsored by the political action committees of the New Right. Their activity has extended to the campaigns of Britain's Conservative Party, and created the Coalition for Peace through Security in opposition to the Campaign for Nuclear Disarmament. The trans-Atlantic linkages of the Old and New Right converge in the policies which now hold sway in NATO and which subvert attempts for nuclear disarmament and arms control.

The Moral Majority asserts its moral superiority but offers no intellectual analysis of nuclear war. No questions are asked about the notions of justice or whether war can ever be just. No questions are raised about the strategy or doctrine of nuclear warfighting. The bankrupt assumption of morality based on the oversimplified virtues of family and faith has neither form nor content. Their church has become the town meeting place for propounding a red-neck theology, tainted by elements of racism and chauvinism. Images of fire and brimstone instill fear and blind adherence. God and evil are *de facto* concepts, presented without analysis or justification.

That the two most powerful political figures in the USA, President Reagan and Caspar Weinberger, may be performing their official duties according to the fundamentalist interpretation of the bible propounded by Moral Majority is truly terrifying.

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Photo: Jeff Sprang, Rural Route 2, Shiloh, Ohio.

The Amish set great store by simplicity. 'Plainness' is seen as linked to inner spirituality.

The Taoists and the Amish: Kindred Expressions of Eco-Anarchism

by Thomas W. Foster

Although worlds apart in time and, seemingly, in culture, the Taoists of Ancient China and the Amish of contemporary America have much in common. Both sects share a commitment to a life of voluntary simplicity, based on strict religious principles. Both put the values of 'community' above those of 'individualism'. Both fore swear those technologies which are deemed a threat to society or the environment. And both reject the formal institutions of the national State, obeying only those laws which are compatible with their religious conscience. We have much to learn from these 'Eco-Anarchists'.

In describing an ideal society Lao Tse (c.604-531 BC) may have been the first to declare that "small is beautiful" and that contentment may be achieved through community and through a simple, natural lifestyle. In the words of the Tao Te-Chin:

Let there be a small country with a small population, where the supply of goods are tenfold or hundredfold more than they can use.

Let the people value their lives and not migrate far. Though there be boats and carriages, none be there to ride them. Though there be armour and weapons, no occasion to display them . . .¹

. . . The more sharp weapons there are, the greater the chaos in the state. The more skills of technique, the more cunning things are produced.²

The person of ideal character would, according to Lao Tse, combine moral action with humility.

*. . . Act, but not possess
Accomplish but lay claim to no credit,
Because he has no wish to seem superior.³*

And, in material terms:

To have enough is good luck, to have more than enough is harmful. This is true of all things but especially of money.⁴

Wisdom, not knowledge, should be the principle which guides human affairs. But wisdom cannot be com-

municated through words, books, or formal education.

. . . It is difficult for the people to live in peace

*Because of too much knowledge
Those who seek to rule a country by knowledge are the nation's curse . . .⁵
He who knows does not speak; He who speaks does not know.⁶*

And the wise man will avoid competing with others. He will:

*Never be first in the world.
Because he does not contend,
No one in the world can contend against him.^{7,8}*

Lastly, formal laws and government intervention will not improve society.

. . . The greater the number of

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statutes, the greater the number of thieves and brigands.

... When the government is efficient and smart its people are discontented.⁹

Anarchism, Taoism and the Amish

The Taoist philosophies of Lao Tse, and the lifestyles which his teachings inspired among his disciples, represent one of history's archetypal examples of religious anarchism. The contemporary Amish are, likewise, anarchists and their simple Christian way of life belies a profound, and sometimes complex, system of individual and group morality with an ancient and enduring history. Of course, I am aware that the word 'anarchist' conjures up images of violent, bomb-hurling political fanatics who would seem to represent the very antithesis of the politically apathetic, peace-loving Amish. But I use the word 'anarchist' here in a more specific sense: namely to refer to those who tend non-violently to reject the formal institutions, laws and technologies of large-scale, bureaucratised civilisations in favour of the informal morality, and the simpler technologies, of small-scale, sacred communities. It is not difficult to find examples of modern thinkers who are representative of the latter version of anarchism. Among the best known may be counted Thoreau, Tolstoy, Gandhi and E.F. Schumacher.

Amish Society

The similarities between Lao Tse's small utopia and the existing social and cultural organisation of America's "Old Order" Amish people are striking. The basic unit of Amish social, political and religious, organisation is the church/community district. Church/community districts are limited in their size by the number of people who can be accommodated in an individual member's house for bi-monthly religious services. There is no church building *per se*, the Amish church being considered a state of mind rather than a physical entity. The practice of meeting in members' homes, rather than in publicly identifiable buildings, is also believed to be related to the Amish/Anabaptist history of persecution in Europe.

Groupings of contiguous church districts within a geographic area are



Photo: R. Weillbacher

The Amish reject any technology which might disrupt their society. Horse drawn buggies are permitted, but mains electricity is strictly forbidden, since it would 'yoke' believers to the profane world.

referred to as a 'settlement'. There are presently about 95,000 members of the "Old Order" or "horse-and-buggy" Amish living in settlements in some twenty US states, as well as in Ontario, Canada and several Latin American countries. The major concentrations of Amish populations in the US occur in the rural Midwest, with the two largest settlements being located at Holmes county, Ohio and Lancaster county, Pennsylvania.

Civil Disobedience and Participatory Democracy

While the Amish are among the most law-abiding of America's minorities, reportedly having almost no adult crime within their communities, they have historically refused to obey laws that they have interpreted as contradicting their religious beliefs. For example, in the past, the Amish have refused to comply with those laws enforcing compulsory high school attendance and with federal legislation making participation in the Social Security and the Selective Service systems mandatory. When it has occurred, Amish non-conformity to law has typically taken the form of non-violent civil disobedience which, as in the above situations, has often resulted in the legal system recognising the cultural uniqueness of the Amish and granting them various exemptions and/or accommodations.

The non-compliance of the Amish in such matters is related to the fact that it is not to governments, nor to secular interests, that they owe their first allegiance (they are, in fact, forbidden by their faith to swear oaths of allegiance to national governments). Rather, the Amish owe their primary loyalty to their *Ordnung*: that is, to rules that are locally formulated by church/community leaders and are discussed and voted upon by a district's members. Most of an *Ordnung* is based upon the leaders' understandings of scriptures, but there may be considerable variation in interpretation from settlement to settlement, or even from district to district. For example, in Ohio, the *Ordnungs* of some church districts forbid their members from living in small towns and from accepting money from any type of in-town employment. Other districts permit their members to live, as well as to work, in towns and even to take factory jobs.

Amish Culture: Key Values

Despite such variations, the Amish of the Old Order clearly recognise themselves as belonging to a single, distinct faith and as being "one people". The core values of Amish culture, which serve to unite the various districts and settlements include:—

1. *Separation from—and non-conformity to—the secular world, in language, dress, the use of modern technologies, consumption patterns, types of residence, etc.* For instance, the Amish employ German as their primary language, dress in dark clothing resembling that of their eighteenth century ancestors, avoid (large-scale) modern technologies and refuse to live in big cities or to adopt urban lifestyles.
2. *Value-oriented rationality, or rationality in the service of family, community and religious ideals.* Such value-oriented rationality, stands in sharp contrast with the "ends-means", or "instrumental", rationality of the larger society.
3. *A preference for small-scale communities, farms and business enterprises.* This is exemplified by the deliberate avoidance of great wealth, large landholdings and other forms of material accumulation.
4. *A reverential attitude toward nature and a respect for the benefits of manual labour.* About half of all Amishmen

are self-employed farmers, many more work in agriculture-related occupations or in manual trades or crafts. Factory work is often regarded as an economic stepping-stone toward the purchase of a farm or a small shop.

5. *Voluntary simplicity.* Great store is set by simplicity and functionality, with complexity and ornamentation being avoided in all things. Outer simplicity or "plainness" is linked to inner spirituality and humility by the Amish.
6. *Christian pacifism, as embodied in the Sermon on the Mount.* The unqualified refusal to take up arms against other human beings or to serve as combatants in military service is a hallmark of the Amish.
7. *Adult baptism.* The belief that only adults should be baptised into the church because only adults can decide rationally whether or not to follow a faith. "No one is born Amish", members of the Order say, "we have all chosen to become Amish".
8. *The supremacy of the sacred community over the rights of the individual.* This is expressed in many ways, but especially through the practices of "banning" and "shunning" those who have rejected the faith, or who have transgressed the moral norms of the community.
9. *Humility.* Personal ambition and individualism are viewed as expressions of selfishness and as being incompatible with the ideal of brotherly love. Unchecked egoism is a great evil and human behaviour must be regulated and limited in accord with man's understanding of God's wisdom.

Appropriate Technology

The Amish, like Lao Tse, view the natural world as a potential garden-place, a virtual cornucopia of abundance if human beings are but wise enough to live in harmony with the ways and cycles of nature. Amish farmers thus attempt to farm as naturally as possible, minimising their uses of chemicals and practising such organic methods as crop rotation, the use of animal manures as fertilisers, and the construction of Martin (bird) houses for controlling crop-destroying insects. Some Amish farmers still believe in planting "by the signs" and draft horses are regularly employed for tilling the soil and other farm tasks. The American Standard Bred horse is typically used to pull traditional black, or grey, Amish buggies which remain the mainstay of family transportation. On the



Photo: R. Weilbacher

Buggies remain the principal means of transportation, binding the Amish both physically and symbolically to their settlement areas.

other hand, Amishmen who are employed in factories may ride to work in carpools with "English" co-workers and other family members may be permitted to accept rides in motor vehicles that are driven by non-Amish friends or neighbours. The Amish find no inconsistency in riding in motorised vehicles—yet in prohibiting their ownership and operation—because they do not believe that the automobile itself is evil. What they fear, rather, is the development of a widespread dependency upon cars among their people which, they believe, would disrupt the social organisation of their families and communities and render them more vulnerable to the influences of an (often evil) outside world.

The predominant use of horse-and-buggy transportation binds Amish youth—physically and symbolically—to their settlement areas, making it difficult for them to avoid the scrutiny of their elders and the social controls of their church/communities. The situation recalls the words of Lao Tse:—

*Let the people value their lives and
not migrate far.
Though there be boats and carriages,
None be there to ride them.¹⁰*

The avoidance of advanced technologies by the Amish is selective, not universal, and those technologies that are perceived to have the greatest

potential for creating external social and economic dependencies are those which are also most apt to be avoided. Hence, sect members may make use of such "modern" devices as pocket calculators, or solar cells for recharging lantern batteries, because these technologies are not viewed as constituting serious threats to community values and self-sufficiency. Conversely, the use of "high-wire" electricity is strictly proscribed, as is connection to other public utilities, which, it is thought, would tend to "yoke" believers to a profane world. While firearms are to be found in most Amish homes, these are for use in hunting and not for self-defence. Again, the verses of Lao Tse seem descriptive:

*Though there be armour and weapons,
No occasion to display them . . .¹¹*

Amish technologies, when properly understood, are neither archaic nor modern—but *appropriate*.¹² I use the term "appropriate" as it was used by Schumacher, that is, to designate a technology of intermediate scale. Such technologies tend to be inexpensive, are readily available to the members of a community and are capable of being produced locally. They are labour, rather than energy, intensive, are minimally harmful to the environment, and they do not violate the humanity of those who use them.

Schumacher believed that a commitment to the use of appropriate technologies would itself make a vital contribution toward the elusive goals of peace, permanence and ecological harmony. But he also thought that no purely sociological formula could ever ensure non-violence and peace among humans, and he quoted Gandhi to the effect that a truly just society would, of necessity, further have to be grounded upon a widely-shared belief in "the God of Love".¹³ In this respect, too, Amish society closely corresponds to Schumacher's notions of an ideal "conservers society".¹⁴

Non-Violence and the Amish

While non-violent resistance to government authority is apt to be associated, in the modern mind, with the teachings of Gandhi and his disciples, the Amish have long practised non-violent civil disobedience. In this connection, the *Martyr's Mirror* is a sacred Amish text that recounts the

tortures and executions of thousands of early Christians and Anabaptists. In fact, due in part to their pacifism, the Amish were driven entirely out of Europe and none remain on the Continent today.

In an often-quoted and telling story from the *Martyr's Mirror*, Dirck Willems, a Dutch Anabaptist is fleeing from religious persecution by local authorities in 1569. In an effort to escape he runs across a frozen lake. He is closely pursued by a sheriff but the sheriff falls through the lake's thin ice and cannot regain his footing. Willems returns and rescues the sheriff, knowing full well that he will be burned at the stake for his efforts. Following the rescue, the weeping sheriff delivers Willems to a certain fate at the hands of executioners.¹⁵

Like the followers of Gandhi, the Amish value manual work, communal life, deep humility and a conviction that moral deeds are far superior to stated intentions in the conduct of human affairs. There is even a Gandhi-like tolerance of other religions among the Amish, who do not believe that salvation is reserved for them alone, nor indeed that anyone can ever know for certain whether

they have earned salvation. Although the Amish do not proselytise—"He who knows—speaks not"—they do accept "seekers" into their fold if the seekers are able to demonstrate through their actions that they sincerely desire to live in accord with the customs and rules of the sacred community.

The parallels between the Amish and the followers of Gandhi (or those of Schumacher) should not be extended too far, however. For, unlike the latter, the Amish avoid national political participation, shun public speaking (before non-Amish audiences) and refuse to take part in any form of court proceeding or legal litigation. In all of these respects, the Amish more closely resemble the more profound political pessimism and spiritual anarchism of Lao Tse.

*The greater the number of statutes
The greater the number of thieves and
brigands . . .¹⁶*

and,

Never be first in the world.¹⁷

Despite the absence of laws, lawyers, courts, prisons or police, Amish society remains virtually crime-free. An Amish attitude toward punishment was expressed by an old Bishop

who told me that it would be better if all the prisons in the U.S. could be torn down. "Prisons", he said, "only make people worse. They should go back to public floggings and shame them into straightening out."

Taoism and the Amish: Some Differences

Although there are some areas of divergence between Taoist and Amish-Anabaptist ethics, these differences do not negate the central point of my thesis; namely, that Amish society represents a special variety of anarchism—a variety, moreover, that has persistently appeared and reappeared throughout human history. While I cannot explore all of the differences between the Taoist and Amish belief systems here, three obvious areas of divergence are:

- (1) The Amish commitment to Jesus Christ as the personification of God and the way to salvation;
- (2) The greater liberality and individual permissiveness of Taoist morality—for example, as regards art, poetry, music and, especially, expressions of sexuality; and,
- (3) The greater introspectiveness and mysticism of Taoism;

Each of these three points may be briefly considered in turn.

The first difference is mediated by the fact that the Taoists believed that the spark of the divine burned within all human beings, but that only some (like Christ?) became aware, or enlightened. It should also be recognised that the Amish commitment to Christ entails, above all, the adoption of a Christ-like *lifestyle*. Yet such a lifestyle, as it is interpreted by the Amish, does not differ substantively from the kind of life that was advocated by Lao Tse, that is, a life dedicated to brotherly and sisterly love, non-violence, simplicity, communalism, spirituality, and closeness to nature. The point is that *how one lives* is as important to the Amish as faith itself—and this was equally true of the Taoists. Salvation, for both religions, rests not upon faith alone but upon an interactive balance between right thinking and right action.

Second, although it seems clear that Amish culture is less Dionysian and expressive than was that of the early Taoists, it should be noted that the principle of moral moderation, or optimal balance, is a major, if not the



Lao Tse, founder of Taoism. Like the Amish, Lao Tse viewed the natural world as a potential cornucopia of abundance, provided that human beings are wise enough to live in harmony with the ways and cycles of nature.

"Let the people value their lives and not migrate far. Though there be boats and carriages, none be there to ride them."

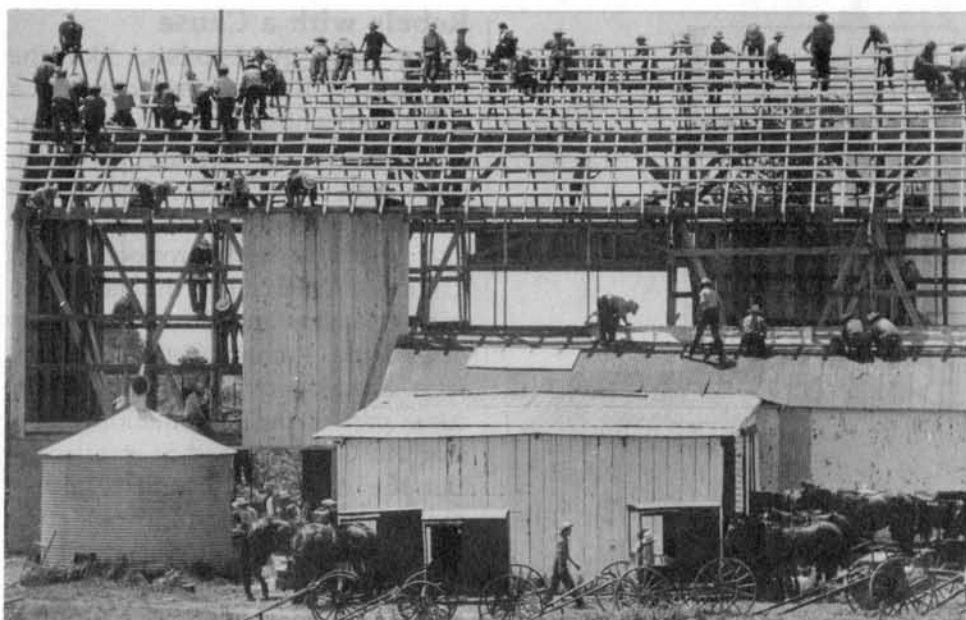
Lao Tse

major, tenet of Lao Tse's teachings. Furthermore, the Amish are considerably less puritanical than is popularly assumed. For instance, smoking, drinking and "bundling" (that is, sleeping with one's clothes on in the same bed as someone of the opposite sex) are allowed in some Amish church districts and illegitimate births, although uncommon, do sometimes occur in Amish communities.

Third, while the Taoists may have been more introspective and meditative than the Amish, who are more given to physical activity and intense social interaction, even this distinction seems to be one of degree rather than of kind. In this regard, I find Hostetler's notion of the "silent discourse" is most interesting.¹⁸ The silent discourse refers to the many ways in which the Amish use silence and inaction to comprehend, and to cope with, the world. For example, rather than answer an outsider's taunt or insult, an Amishman may merely remain silent, and Amish parents may simply choose to ignore some of the transgressions of their teenaged children. But silence and inaction can, it seems to me, also be viewed as typically Taoist, or Buddhist, reactions to many of the moral problems and paradoxes of life. Thus, the sage triumphs through *inaction* and understands the utility of *emptiness* and *non-being*. "He who knows—speaks not". Finally, it should be emphasised that the Taoists were not introspective hermits, but utopian communalists, and as Knoll points out, their admonition to know and to cultivate the self were—and were meant to be—other-directed. Lao Tse, no less than Confucius and the other Chinese philosophers, was preoccupied with the problem of government. "The Way is essentially utopian. The echo of a distant Golden Age . . ."¹⁹

Products of Disturbed Times

How are the similarities between
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Building a barn. All the local community pitch in to help.

Photo: Jeff Sprang, Rural Route 2, Shiloh, Ohio.

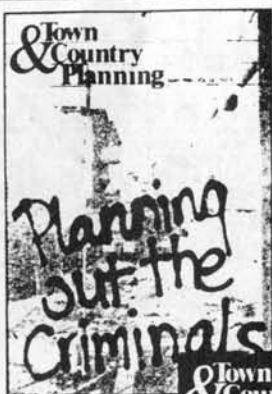
the world-views of Taoism and Amish-Anabaptism to be explained? It is safe to assume that there has been little, or no, cultural diffusion between the two belief systems. It does, however, seem likely that the two cultural systems may have evolved as similar responses to certain common types of historical challenges and experiences. There is abundant historical evidence that both Taoism and Amish-Anabaptism developed as the religions of persecuted outsiders; both were the faiths of rebellious intellectuals and of exploited peasants, and, to some extent, both were reactions to widely perceived, and deeply felt, moral, economic, and social, injustices. As such, both were highly critical of the political and cultural establishment of their day.

Taoism, for example, was much more than a religious subculture in China; it was a brilliant and stinging rebuke of the existing social order of China and its supporting culture. Lin Yutang says that the Taoists' "sharpest shafts were always directed at official pomp and dignity."²⁰ Lao Tse and Chuang Tse were devastating critics of China's pampered mandarins, of her ritualistic civil servants, and of her greedy, aggressive, militaristic politicians.

Confucianism, the idealistic religious philosophy which most Chinese officials and civilised gentlemen purported to follow was, according to Lin Yutang, a favourite target of the nihilistic Taoists who "saw through the folly and futility of the Confucian saviours of the world . . ."²¹ Con-

fucianism broadly supported action, Taoism inaction (or action only in accord with nature). Confucianism taught respect for authority and bureaucracy (Confucius being the father of the Chinese civil service system); Taoism advocated community and equality. Confucianism revered academic study and logic; Taoism taught reliance upon naturalistic observation and intuition. Confucianism rationalised civilisation; Taoism dissected its weaknesses and offered antithetical, countercultural alternatives. As Lin Yutang comments: "Confucians worship culture and reason; Taoists reject them in favour of nature and intuition . . . Confucius was a positivist; Lao Tse a mystic."²²

The tenets of Taoism, like the later tenets of Anabaptism, initially proved to be more compatible with the naturalistic, resigned, *laissez-faire* attitudes of peasants than with the aggressive beliefs of the wealthy and educated classes; hence, the early adherents of both faiths were mostly peasant farmers. Eventually, however, Taoism gained greater respectability among China's higher classes (unlike the Amish faith in Europe which remained a religion of the common people) and some Chinese scholars attempted to reconcile its principles with those of Confucianism. The fact that such a reconciliation was never completely successful is reflected in the saying that every Chinese gentleman is a Confucianist when he holds official power and a Taoist when he returns to private life.



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Rebels with a Cause

The early Anabaptists, like the founders of Taoism, were critics of a civilisation which they perceived to be at once morally corrupt, affected, unnatural, materialistic, violent and generally ungodly. And, just as Lao Tse is said to have dropped out of Chinese officialdom,²³ the first Anabaptist leaders and theologians were disaffected Roman Catholic clerics who abandoned Catholicism to become part of the Reformation movement in Germany and Switzerland.²⁴ But the Anabaptists, unlike Luther, carried their critique of existing European social institutions far beyond purely theological questions and into the considerably more dangerous areas of political, economic and social, organisation.²⁵ The Anabaptists became advocates of numerous religious and social reforms that they proposed to implement within their own communities—and among their own people. These reforms won them rapid popularity and a wide following among the peasantry, but they were widely feared by governments and by rival religious factions, who conspired together in the Anabaptist persecution.²⁶

The Amish, who had splintered off from the older, Mennonite Anabaptists, under the leadership of Jacob Ammon in 1693, were among the most orthodox, conservative and uncompromising of the Anabaptist sects; accordingly, they were singled out for the most severe forms of persecution. Their deliberate non-conformity and steadfast pacifism resulted, initially, in their being forced to live in isolated and remote areas and, finally, in the complete Amish exodus from Europe.

Rejecting Civilisation

The Anabaptist leaders, like the Taoists before them, concluded that civilisation itself was essentially flawed and irredeemable and that, to achieve salvation, it would first be necessary to seek a more authentic mode of existence.²⁷ Separation from the world therefore became as important to the Amish as it had been to the Taoists. For both Bishop and Sage, it was impossible to be both a worldly person and a holy person. The seeker after the divine would have to distance himself or herself: physically, psychologically and socially, from the

hurried and frantic, yet essentially frivolous or harmful, pursuits of civilised life.^{28,29,30} Peace and wisdom were to be found far from the city, through the regular rhythms of a communal life in the midst of natural surroundings. In such a setting the believer would exert a moral influence upon others and would become, as the Amish are wont to say, "A light unto the world". Or, as the poetry of Lao Tse expresses it:

... The Sage embraces the One
And becomes the model for the world.
He does not reveal himself,
And is therefore luminous . . .³¹

... He who is conscious of the white
But keeps to the black
Becomes the model for the world . . .³²

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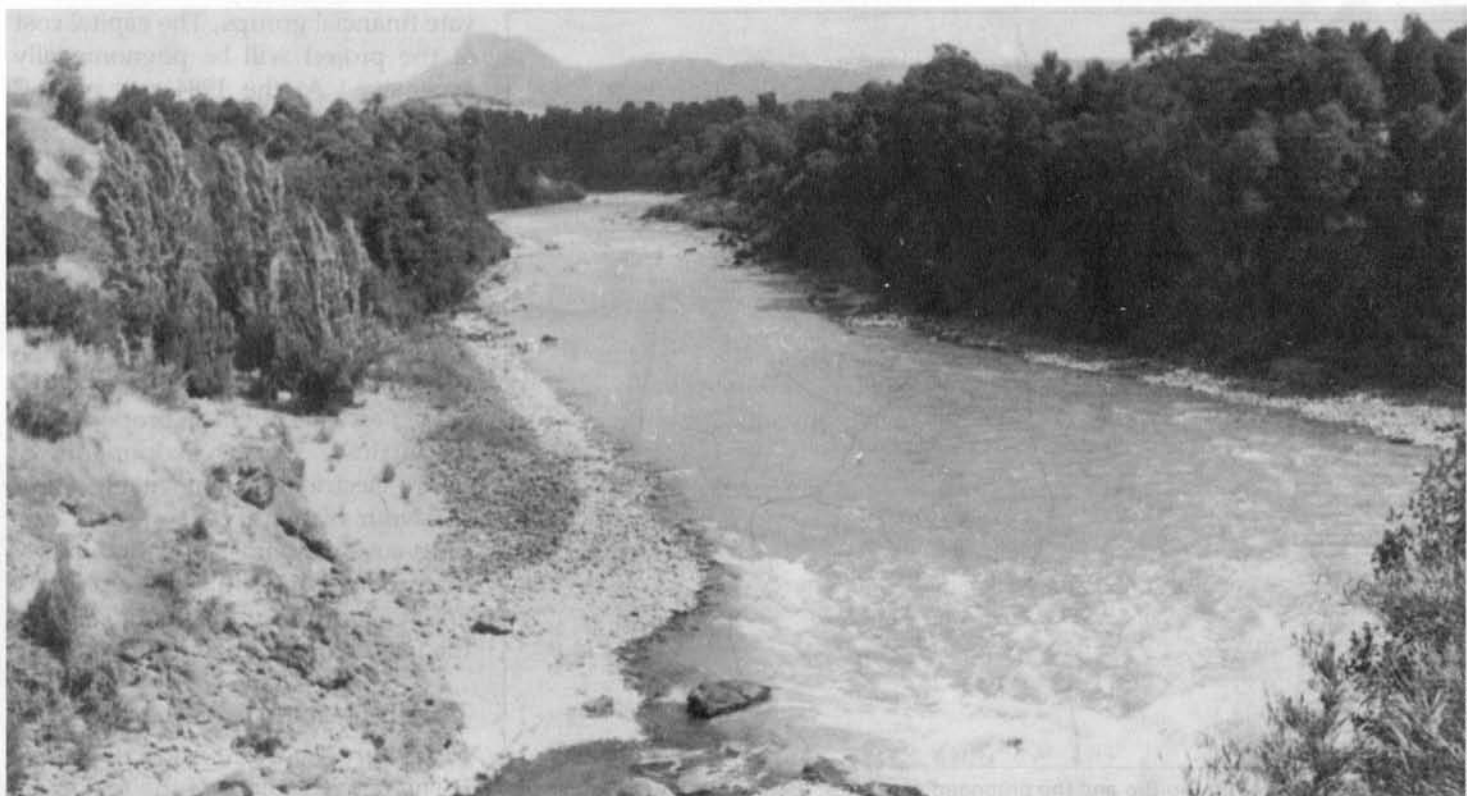


Photo: J. Sears

The Rio Bio-Bio at Huequecura, where one of the proposed dams is planned.

Bio-Bio: A River Under Threat

by John Sears and Katherine Bragg

The Rio Bio-Bio is the longest river in Southern Chile. Beloved by fishermen, naturalists and intrepid rafters, the Bio-Bio descends from the Cordillera through spectacular gorges, flanked by the native forests of the Andes. If Chile's national electricity company—ENDESA—has its way, however, the next twenty years will see the river impounded by a series of six large dams. Half the ancestral lands of the Pehuenche Indians, a tribe of forest dwellers, will be flooded, destroying once and for all the Pehuenches' traditional way of life. Studies of the likely ecological impact of the scheme have yet to be undertaken—but the damage is expected to be extensive. The area is volcanically active and prone to earthquakes, and the risk of one of the dams collapsing must be high.

Where the blue waters of the River Queuco meet the white waters of the River Bio-Bio in swirling beauty, the call of the Chilean Elaenia (*E. albiceps*) can be heard. It is after the "bee-o bee-o" cry of this bird—a flycatcher—that the river was named by the indigenous Mapuche people.

Arising in the Cordillera from Lakes Galletue and Icalma (altitude 1100m) the Bio-Bio flows, unusually for South America, in a north-westerly direction for 300 kilometres before entering the Pacific Ocean at Concepcion. The total catchment area is some 7,000 square kilometres.

For many years, covetous eyes have been cast on the vast potential that the Bio-Bio offers as a source of seemingly cheap and inexhaustible hydro-electric power. It was not, however, until 1980 that ENDESA—Chile's national electricity company, the Empresa Nacional de Electricidad—started field research in the Alto Bio-Bio. Their studies suggest that the useable potential of the river is a mammoth 2900 megawatts, which is significantly higher than total current electricity production in the whole of Chile (about 2300 megawatts). Furthermore, it has been estimated that the Bio-Bio could provide about 11 per cent of the untapped hydro-electric potential of Chile's mountainous terrain. As such it offers a challenge for geologists and civil engineers, plus a juicy carrot for ENDESA, its fin-

anciers and an unpopular military dictatorship.

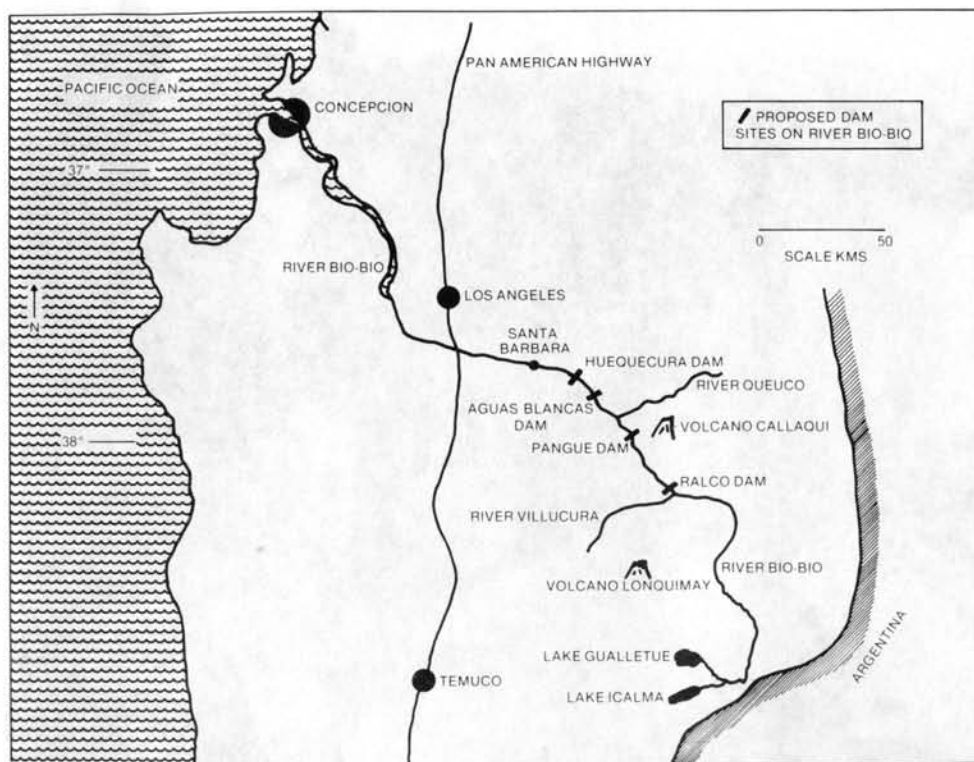
Six Dams

ENDESA is planning to construct six dams and reservoirs in the Alto Bio-Bio (see Table 1 and Map, p.16). Construction work on the Pangue, Ralco and Huequecura dams is scheduled to start in the 1990s. Five reservoirs would lie upstream from Santa Barbara, a town of 7000 inhabitants, and a sixth dam is planned at Quitraman, downstream near the Pan-American highway. The elevation drop of the Bio-Bio River in the total length intended for hydro-development is some 770m. The six reservoirs would have a collective volume of $4987\text{M}^3 \times 16^6$.

The Llauquen reservoir, upstream from the village of Ralco, would have

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(Above) Map showing Rio Bio-Bio and the proposed dam sites. (Below) Technical details of the proposed dams.

TABLE 1 PROPOSED HYDRO-ELECTRIC DEVELOPMENTS ON THE RIVER BIO-BIO, CHILE

From ENDESA Office of Evaluation of Hydro-Electric Projects, November, 1984.

Dam Siting	Installed Potential Mw	Volume of Dam $M^3 \times 10^6$	Volume of Reservoir $M^3 \times 10^6$	Length of Tunnel or Canal (Km)	Brute Height of Dam (M)	Flow Rate $M^3 sec^{-1}$	Dam Type
Llanquen (upstream)	370	17	2340	0.7 Tunnel	170 170	255	Fill
Ralco	700	0.64	1220	6.0 Tunnel	189 130	500	Concrete Arch
Panque	620	7.3	500	0.2 Tunnel	126 142	600	Fill
Aguas Blancas	660	0.7	33	0.3 Canal	99 100	800	Fill
Hoequecura	150	0.14	19	—	32 54	580	Gravitational Concrete
Quitraman (downstream)	400	3.2	895	0.3 Canal	43 53	1050	Fill

the greatest capacity ($2340M^3 \times 10^6$). The Ralco project is the largest of the six and would be expected to generate up to 700 megawatts. Fifty-four per cent of the reservoir's volume ($1220M^3 \times 10^6$) would serve to regulate water, the rest of the dam's height providing drop (potential) and to absorbing sediments deposited during operation. The Ralco reservoir alone would flood a large area, extending for 25kms on the Bio-Bio and 20kms up the Villacura River.

The electricity generated would be consumed mainly in Santiago and Valparaiso. ENDESA has argued that the Bio-Bio development is essential for the regeneration of the Chilean economy, now in recession, with unemployment running at 30 per cent. Elections have been scheduled for

1989. The Pinochet regime is facing increasing opposition, the prospect of truly democratic elections and the restoration of human rights seeming almost as remote as when Pinochet seized power in 1973. The regime sees grandiose development schemes as a means of placating Chileans with the promise of a fall in unemployment. What, however, are the real costs of such a scheme, financial, social and environmental?

Finance

Funding for the scheme would come primarily from the Inter-American Development Bank and, secondarily, from the World Bank. Both institutions have funded ENDESA projects in the past. Further funding will also be provided by undisclosed pri-

vate financial groups. The capital cost of the project will be phenomenally expensive.¹ At the 1984 rate of 91.7 pesos to 1 US dollar, the direct cost would be \$946,873,000. Of this, some \$234,487,000 would be purely financing costs. Add to this an annual interest rate of 10 per cent and the fact that, as of June 1986, inflation had further so devalued the peso that it was down to an exchange rate of 198 pesos to the US dollar, and the capital costs of the project escalate out of all proportion to its intrinsic worth. Proponents of hydro-electric dams inevitably argue in favour of the apparently low running costs of dams, but this ignores the problem of rapid silting up of reservoirs and the subsequent decline in the useful life of any dam.

The Threat to Indigenous Peoples

The native Indians of the region are Mapuche, which, translated from their tongue, means "People of the Land". Traditionally, the frontier of their territory (Araucania) extended southwards from the River Bio-Bio. Fiercely independent, they were never subjugated by the Spanish conquistadores and, despite the creation of reservations in the 1850s, resisted until recently all attempts at integration. There are now perhaps 500,000 Mapuche people living in only a small part of their original Araucanian lands, which were communally owned. Their status has been further undermined by a 1979 Decree which insensitively divided their communal land into private plots. The Decree states that all indigenous people are now Chileans, so that officially the Mapuche people have ceased to exist.

In the Cordillera of the Alto Bio-Bio, one tribe of Mapuche still lives in the traditional manner, collecting pine nuts and other foods from the forest, and are relatively isolated from the mainstream of "Campesinos", whose tiny farms fringe the Bio-Bio between Ralco and Santa Barbara. These are the *Pehuenche* or "People of the Pehuen tree" (*Araucaria araucana*), better known as the Monkey Puzzle or Araucarian "Pine". This tree, a primitive conifer, is extremely slow growing and may live for more than 1,000 years. It is a relict species which during quarternary glaciations was distributed as far north as Brazil.² It

now occupies a relatively restricted range above 1000m in the Southern Andes, but also grows in the coastal mountains at the same latitude in the Alto Bio-Bio. In recent times, clear felling has reduced its range still further. Natural regeneration is made difficult by goats and cattle that browse the seeds and seedlings. It is also overtopped by the more vigorous high altitude Southern Beech (*Nothofagus pumilio*), bamboo and coirron tuft grass.

The Pehuenche people practise seasonal migration between two zones in their territory. In summer and autumn, they live largely as food gatherers in the upland Araucaria forest, collecting herbs and fungi, but mainly the nutritious seeds of the Araucarian Pine which forms the staple item of their diet. The female cones only produce copious seed every third year, so nuts are gathered for store. In winter, the Pehuenche return to lower elevations along the River Bio-Bio and its tributaries. Here they subsist on pine nuts and by goat and sheep-herding. Ironically, they named the sites where two of the largest reservoirs would flood their land—*Ralco* ("stream of the wooden plate") and *Panque* (from *Nalca*, a native type of rhubarb, *Gunnera chilensis*).

There are perhaps 5,000 Pehuenche living in this traditional manner, intimately dependent on their Araucaria/Beech forest ecosystem. Their homes are built from hand worked planks. Forest plants are used as medicines, the Pehuenche having a wealth of knowledge on the medicinal properties of local herbs. Spiritually too, the forest is their temple. Their worship is complex and addressed to one God, with the spirits of fire, the mountains and especially the Pehuen tree held in sacred reverence. Even the slender-billed parakeet (*Enicognathus leptorhynchus*), which feeds on the seeds of the tree's cones, has spiritual and religious significance to the Pehuenche. In common with other forest peoples who are dependent on their immediate ecosystem, the Pehuenche have traditionally lived as true conservationists in harmony with nature, taking from the productivity of their ecosystem only enough to satisfy their needs. This is a far cry from the purely exploitative greed of utility companies and the

energy intensive agricultural and industrial societies which they supply.

Construction of the Llauquen, Ralco and Pangué hydroelectric projects, with the attendant deforestation and flooding, will irreversibly destroy over half of the Pehuenche's territory and would encroach on the lower fringes of the Araucaria forest, a tree now regarded by ecologists as an endangered species. The ENDESA project could employ up to 4,500 local people as short term labourers on dam construction work. Some of these would be campesinos whose farmlands would be flooded by the downstream reservoirs. As yet there are no plans for resettlement, but in the case of the Pehuenche, the failure of any schemes will be absolute. Stripped of their identity and traditional forest home, they will be vulnerable to unscrupulous exploitation. Yet the ultimate desecration would come with the systematic dismembering of their forest ecosystem, which symbolises their religious faith and provides for their subsistence. If Santiago Cathedral or York Minster were razed to the ground to make way for some novel technology, there would rightly be a public outcry in both those countries. Yet people could still choose other houses of Christian worship, but for the Pehuenche of the Alto Bio-Bio there is only one spiritual home. Sadly, the Pehuenche are almost totally unaware of the disaster which could befall them.³

Destruction of Forest Habitat

Chile, with some 5,500 species, has an incredibly rich flora showing a marked affinity to genera in New Zealand and Africa, due to geographical connections which terminated in the Tertiary period. Much of this diversity lies in the Southern Beech and Araucaria forests where many species endemic to Chile abound. The Alto Bio-Bio has a very rich avifauna including condor (an endangered species), gray-headed goose (a food source for the Mapuche) and Chilean pigeon, a species restricted to the Araucaria forest where it is declining due to the destruction of its habitat. Large mammals of the high Cordillera including puma, wild cat and wild-boar have been observed along the Bio-Bio in winter. A partial list of forest and riverbank plants and ani-

mals observed in the Alto Bio-Bio is to be found in Table 2.

Ecological surveys should be a prerequisite before any development scheme is even considered. The management of forests and rivers should be directed towards maintaining natural species diversity and ensuring that indigenous peoples and their cultures continue to be sustained. Yet ENDESA has been given a carte blanche to proceed without any such surveys being carried out. Nonetheless, hydrological studies are already well under way. Access to the river is firmly barred to outsiders.

Chile has a strong tradition of herbal medicine gleaned from the accumulated wisdom of indigenous peoples. As the drawbacks of synthetic drugs becomes more widely appreciated, enlightened scientists are beginning to evaluate the therapeutic value of wild plants. The Bio-Bio project could mean the loss of potentially valuable medicinal species and the store of knowledge held by its Pehuenche people. The loss of diversity among animal species could be

TABLE 2
Forest and River-bank Plants
and Animals observed in the
Alto Bio-Bio.

Plants

*Araucaria araucan**
Nothofagus dombeyii
Nothofagus obliqua
Embothrium coccineum
*Guevino avellana**
*Peumus boldus**
Podocarpus andinus
Alstroemeria haemantha
*Gunnera chilensis**
*Rosa moschata**
*Chusquea coleo**
Berberis spp.*
Puya sp
Ephedra sp.
*Fuchsia magellanica**

Birds

Chilean wren
Chilean swallow
Chilean elaenia
Black faced ibis
Chilean lapwing
Chilean cinclodes

Mammals

Andean fox
Viscacha
Hare

* Species with medicinal, herbal or food uses.

quite serious. Some animals are very sensitive: guanaco, huemul (long eared Andean deer) and pudu (miniature deer) have all disappeared from the Alto Bio-Bio in recent times as a result of only modest human encroachment.⁴ The project could result in the local extinction of the region's large carnivores.

Adverse Effects on River Eco-System

The project would create a series of six reservoirs with a collective volume of five hundred million cubic metres, lying between 37° and 38° south and at altitudes ranging from 250m to 1000m. The reservoirs would lie in Chile's cool temperate zone, and behave as warm monomictic lakes,⁵ stratifying into an epilimnion, thermocline and hypolimnion in early summer. During the autumn overturn, loss of heat would result in the breakdown of stratification and vertical mixing of the water until the spring. If water is drawn from the reservoir below the thermocline, the summer water temperature down river will be low (6°-8°) and may contain little oxygen as well as dead and dying bacteria and algae, in addition to ferrous and sulphide ions. This would increase biological oxygen demand and cause sufficient pollution to kill sensitive species—trout and salmon, for example—for considerable distances downstream.

The proposed reservoirs could create other serious problems along the Bio-Bio. As water is drawn off to generate electricity, so the water level in the reservoirs would fall dramatically, exposing a bare shoreline between the high and low water-marks which animals and plants cannot readily colonise. Similar problems are likely to occur downstream of each dam. Impoundment would reduce markedly the flow of the Bio-Bio, causing a sharp fall in its water level; yet, discharges from the reservoirs would release sudden surges of water downstream. The rapid fluctuations in water levels could result in a serious decline in river bank species. Rapid drawdown would destroy benthic species, which would also have to contend with the river bed being blanketed with silt whenever the accumulated sediments within the reservoirs were flushed out.

Even with the construction of fish

passes, the six hydro-dams would collectively cause such rapid variations in physico-chemical conditions along much of the Bio-Bio that a serious decline in both the diversity and abundance of fish species must inevitably follow. The impoundment of the river would drastically reduce flow rates at its mouth, resulting in saline intrusion. Pollution problems would also arise where water is abstracted for domestic and industrial use.

Eutrophication and Siltation

At present eutrophication and siltation are minimal in the Alto Bio-Bio River. Rainfall averages 2000mm per annum concentrated in the winter months. Since the higher elevations are well forested, nutrient enrichment

"Stripped of their identity and traditional forest home, the Pehuenche will be vulnerable to unscrupulous exploitation."

from agriculture is insignificant. The forest bio-mass stores nutrients and minimises water flow through the soil profile.

The creation of reservoirs in the uplands would be accompanied by significant deforestation. Studies in other regions of the cool temperate zone illustrate the bio-geochemical problems in rivers and lakes which result from clear-felling in the catchment area. At Hubbard Brook, USA,⁶ the removal of forest cover drastically reduced transpiration, resulting in a marked increase in leaching of water through the soil profile. As a result, nitrogen outflow through the ecosystem increased 30 times and nitrate levels in the water exceeded existing pollution standards (10 ppm) for over a year. Drainage water from forest ecosystems is very low in phosphate as such ecosystems have an excellent capacity for accumulating and retaining mineral ions. However, deforestation enhances phosphate leaching. The threshold for the appearance of algal blooms in affected reservoirs is 50 micrograms of PO₄ per litre, which can soon be exceeded. Initially, eutrophication can yield productive fish-

eries in large reservoirs, but these are not sustainable, for as the pool of available nutrients increases, so does the biomass of algae and aquatic macrophytes. Beyond a critical point, the biological oxygen demand, due to decaying matter, increases to levels which cannot sustain fish populations. This has been the case in Africa's Lake Kariba.⁷

Eutrophication is further accelerated by the entrapment of nutrient rich silt in the reservoir, resulting from erosion within the deforested catchment zone. This is an accumulative process which can drastically reduce the functional life of a dam reservoir. Blackwelder⁸ has recommended that "dams should only be built where it can be guaranteed that they will not silt up within a hundred years". Unfortunately the track record of many dams around the world has fallen far short of these recommendations. This is especially true in the inter-tropical zones where deforestation can lead to very rapid silting. Thus the rate of sedimentation of the Nizamsagar Dam in India was found to be over 16 times greater than the predicted rate. In China, the Sanmexia reservoir silted up after only four years of operation. Observations of fast-flowing rivers in the southern Andes suggest that silting of man-made lakes could be a serious problem. On the River Liucura above Pucon, where the banks are clothed by semi-natural *Nothofagus/Podocarpus* woodland, silt has accumulated up to depths of 1.2 metres. This silt may largely come from the erosion (by rain and melting snow) of porous volcanic materials in the high Cordillera.

Structural Problems

A theoretical picture of the stresses and strains that a dam might encounter in a specific location can be built up by field survey data, including borings, correlated with structural models and a computer analysis. The properties of underlying strata and their suitability must be determined before a decision is made to proceed with construction. Moreover, as dams become larger, the stresses on foundations and structures, plus the risks of overspill, leaks and failures from earthquakes, volcanic activity or design and construction faults, become increasingly critical. The Colbun dam in Central-Southern Chile, which

opened in November 1985, had already developed quite serious leaks by January 1986.

The Ralco dam would involve a concrete arch structure. Arch dams exhibit great strength, but their very rigidity renders them sensitive to movements at their abutments. They are, therefore, not suitable in regions of known seismic or volcanic activity, but only where the supporting rock is structurally sound. In the seismically active region of the Alto Bio-Bio, concrete buttress dams might seem a safer bet. To reduce the risks of serious leaks or collapse from seismic action, the buttress lengths should be limited and flexible seals should be used. In practice, the design and construction criteria are extremely critical and a calculated risk is taken in such a seismically active zone, especially when the technology of large dam building is still incompletely understood.

Embankment dams (which would be built at Llanquén, Pangué, Aguas Blancas and Quitrman) have several potential design weaknesses, one of which is the leakage of water from the reservoir through the river bed beneath the dam. Such seepage can accelerate, eventually causing failure at the downstream face. Studies by ENDESA at Aguas Blancas and Quitrman have already revealed the high porosity of fluvial and volcanic materials at these sites. Insertion of clay cores could minimise seepage. Even so, the failure (or indeed the overtopping) of one or more dams could devastate the small town of Santa Barbara lying 0.5 km from the Bio-Bio below the reservoirs. The small farms along the Bio-Bio from the River Queuco to Santa Barbara would also be at grave risk of flooding from failure of an upstream dam.

Earthquake and Volcanic Risk

Large dams continue to be built in seismically sensitive regions despite the risks. The Tehri dam in the earthquake zone of the Himalayas⁹ is only one example of erroneous siting. In the southern Chilean Andes, the risks are further compounded by numerous active volcanoes. During 1985 and 1986, Villarica, a volcano 200 kilometres, due south of the Alto Bio-Bio, billowed forth smoke and ash, glowing red against the night sky.

The riskiest aspect of the ENDESA



Santa Barbara — "Failure or overtopping of one or more dams could cause serious flood damage."

Photo: J. Sears

project must be the siting of large reservoirs in an area of two active volcanoes. The Pangué reservoir (volume $500\text{M}^3 \times 10^6$) would be situated just below the slopes of Volcano Callaqui! Volcano Lonquimay lies within 50 kilometres of the Ralco and Quitrman sites. Although one of Santa Barbara's older residents was unable to recall an eruption of Callaqui in her lifetime, the volcano spews out steam and smoke regularly. Modern "plate tectonics" theory has given us insight into the instability of the geologically young Andean range, its montane plates floating on the molten magma underneath. Volcanic and seismic activity were recorded by Charles Darwin as long ago as 1835 when Osorno in Southern Chile and Aconcagua, 400 miles north, erupted simultaneously. Coseguina, 2700 miles north of Aconcagua, also erupted at that time, with an earthquake extending over 1000 miles.¹⁰

Even ENDESA has admitted that the risk of a volcanic eruption "is an important aspect that has yet to be defined". Our current knowledge of designing large dams to resist earthquakes is still very uncertain, despite computer simulations and model testing. Ultimately, safety can only be tested under operating conditions. In 1963, the Vaiont dam in Italy was overtopped to a depth of 100m by a huge flood caused by a massive landslide during filling of the reservoir.¹¹ Although the dam held, the overtop-

ping caused a tragic loss of human life. More recently a landslide has threatened the Tablachaca dam in Peru, dangerously near Lima.¹² Even in areas remote from earthquake zones, seismic activity may be induced by the sheer mass of water bearing down on the bedrock of the reservoir. Cases have also been cited where too rapid filling or emptying of a reservoir has induced activity.¹³

Building reservoirs in an area as prone to seismic and volcanic activity as the Alto Bio-Bio is to invite trouble. There will always be a high risk of the dams collapsing. Inevitably, those living downstream of the project will live under constant threat of being flooded out of house and home.

Flood Risks

The risks of flooding are extremely difficult to quantify precisely. Estimates are based on probabilities of high rainfall, based on available records. For the Kariba dam, it was estimated that a flood up to $7,600\text{m}^3/\text{sec}$ might be experienced one year in four. During the first and second years of construction, floods of $8,500$ and $16,200\text{m}^3/\text{sec}$ respectively were recorded.

For the Alto Bio-Bio, flood prediction data are not currently available. The risks would be compounded by deforestation, which would result in a massive increase in flow rates to the upland reservoirs during heavy rains, leading to the possibility of over-

topping (which weakens the dam's structure) and potentially serious flood damage downstream. Where a series of dams are constructed with a 700 metre drop between the first and the last, as would be the case in the upper Bio-Bio, overtopping of one dam could flood the next reservoir, causing a domino reaction, with one dam after the next overtopping. By the time the resulting "wave" reached Santa Barbara, it could cause widespread devastation.

The construction of shaft or tunnel spillways might appear to be one solution, since much of the energy of the water could be dissipated downstream of the dam. However, the released water has to be channeled somewhere and the traditional "solution" has been to contain a river between embankments. At Puente Piulo, 25 kilometres upstream from Santa Barbara, the Bio-Bio flows placidly through a deep and narrow gorge overlooked by spiky Puya plants. This might be viewed as a natural flood control channel, as the river would have to rise by some 20 metres (only 10 metres in winter or spring) to overtop the gorge. Effectively, flood discharge would increase both the volume and flow rate of water coursing through the gorge, resulting in a tidal bore effect. Less than one kilometre from Puente Piulo, the river pans out from the gorge into a

valley of small farms, with Santa Barbara lying downstream.

Conclusions

The ENDESA project is yet another example of inappropriate, potentially dangerous and non-sustainable high technology being foisted on a region of unique natural beauty and on an indigenous people living unobtrusively in their traditional ways. Now, before it is too late, a number of pertinent questions need to be asked about the dubious wisdom of this phenomenally expensive scheme.

1. *Is the extra electricity generation really necessary?* Predictions by ENDESA of a 7 per cent growth in demand are based on studies made during the economic boom years of 1976-82. ENDESA now admits that real demand is only likely to increase by 2 per cent per annum. With the Colbun hydro-dam now on stream, and a new dam on Lake Chapo scheduled for completion by the early 1990s, there will be more than adequate capacity for any upsurge in consumption.

2. *With a capital cost around one thousand million dollars, might it not seem far more prudent to invest a fraction of this in sustainable energy conservation technology?* Current industrial and domestic conservation measures are non-existent in Chile. Implementation of energy saving schemes would make the building of further large-scale hydro-dams unnecessary. Such projects might lack the grandiose appeal of damming mighty rivers, but indigenous cultures and forests would not be destroyed. Instead, employment could be generated over a wide area. Moreover, the technologies that would be used, small-scale farm and community hydro-, wind or solar generators, for example would be both sustainable and appropriate to the needs of rural areas.

3. *What surveys are being done of the diversity of plants and wildlife in the project area?* Has the ecological impact of the scheme on the riverine and forest eco-systems been fully assessed? Which endangered species would disappear? Have there been sufficient studies of the potential medical uses of those wild plants which might be lost?

4. *How precise are the forecasts concerning the possibility of overtopping, dam failure, or serious flooding being caused by volcanic activity in the region?* The Pangué reservoir would lie near the foot of Callaqui Volcano. Would regular monitoring for seismic activity be undertaken? What indemnity would there be

against the very real risks of an earthquake or a volcanic eruption destroying one or more dams?

5. *What would be the functional life of each of the six reservoirs, bearing in mind that dams in deforested regions can silt up in less than thirty years?*

6. *What plans are there for the resettlement of the peoples who would be displaced by the scheme?* Is it fully appreciated that the Pehuenche Indians, dependent materially and spiritually on their forest ecosystem, could never be satisfactorily resettled and that their culture would be totally destroyed? Is it not a moral obligation of humanity to help to conserve and respect the way of life of indigenous peoples, conflicting though it may be with a desire for gain?

To her credit, Chile is in the forefront of South American nations in terms of habitat protection for wildlife. At the Lauca National Park in the Chilean Altiplano, vicuna, guanaco, flamingoes and rheas are protected. This applies equally to the unique woodland micro-climate of Fray Jorge, lying in arid desert south of La Serena. Will the same concern be allowed to flourish for the Bio-Bio, its forests and indigenous peoples?

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A Leaf out of St Barbe's Book

by James M. Fitzwilliams

An ancient Kashmiri adage says: "Food will last as long as forests do". Richard St Barbe Baker was fully aware of the vital ecological role played by trees, devoting his life to safeguarding the natural environment and, in particular, to conserving trees. Although the man is dead, his ideas and practices are of greater relevance today than ever before.

Fundamental to St Barbe's philosophy was an environmental ethic, based on a great understanding and respect for nature. This is what O'Riordan¹ terms the "bioethic", the "notion in romanticism and ecocentrism of man's moral duty toward and respect and reverence for nature. It holds that the natural world has biotic rights, including the right to existence, which are quite independent of its usefulness to man."² Often environmentalists advocate that, just as people have laws to protect them, so should nature; there should be, for example, "a Bill of Rights for the four million other sorts of plants and animals with which we share this planet".³

Implicit in this "bioethic" is the idea that in order to care for nature and our environment, people should be able to relate to it in a way that is *not* purely scientific; by "scientific" I refer to that reductionist approach which regards man and nature as two separate entities.

St Barbe: The Man

St Barbe was born in 1889, the son of an eccentric tree worshipping clergyman. His ancestry included two famous rectors of Botley and Samuel Baker, the famous explorer who helped to discover the source of the Nile. It was early on whilst working on his father's tree nursery, that St Barbe gained a love and reverence for nature, especially trees.

St Barbe left school in 1909 for Saskatchewan, Canada. In 1913, he attended the newly formed Saskatchewan University where he studied Arts and Science. Living in a tent in Beaver

Creek for much of the time, he liked to immerse himself in nature, a lifestyle not so different from that of Thoreau. While in the wilds, his respect for nature grew and contact with some of the Indian tribes enabled St Barbe to witness a society that benefited from its cooperation with nature. After a year at Saskatchewan, he returned to England to study Divinity at Cambridge. During the Great War St Barbe joined King Edward's



Richard St. Barbe Baker

Photo: Ian Anderson

Horse Troop and was later given a commission in the Royal Horse and Field Artillery. It was possibly during this time that he became a pacifist, realising that ecocentrism with its belief in co-existence between people and their environment, constituted a sound philosophy.

In 1918, he was back at Cambridge studying for a diploma in forestry, selling caravans constructed from old war-plane fuselages provided the necessary finance. Sent to Kenya in 1920 by the Colonial Office, St Barbe

initiated one of the earliest recorded forestry schemes to be based on bio-ethical principals. He spent hours telling the local Kikuyu of the importance of their trees and explaining how their continued clearance represented a threat to the survival of the tribe. His one man campaign led to the voluntary cooperation of thousands of Kikuyu tribesmen. They formed an army of tree planters and nurturers. Known as the "Watu wa Miti"—literally, "Men of the Trees"—every member promised to plant ten trees a year and to take care of trees everywhere. The Watu wa Miti planted trees ceremoniously and with respect; the value to the tribe was recognised, yet it was also recognised that the trees had a right to exist.

St Barbe believed that *everyone* could have an appreciation of nature; he thus devoted his life to instilling a "tree sense", as he called it, into the people he met. His method was one of example, acting on his own words. A person with a "tree sense" was someone who recognised the essential role of trees in the environment. Having recognised this they would then regard nature in a spirit of humility and reverence. As he put it: "The man who plants trees loves others beside himself."⁴ In so doing, such a person leaves a legacy that can be enjoyed by future generations. By instigating reafforestation in the spirit of the bioethic, St Barbe was acting for humanity as well as in humility to nature.

A Growing Tree Sense

Encouraged by the success with the Kikuyu army of tree planters—they continued to nurture their trees long after St Barbe had left them—St Barbe initiated other planting schemes. He also investigated further the Taungya system (taungya is Burmese for "hill

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cultivation") in which trees and food are cultivated at the same time. St Barbe saw such "agro-silviculture" as a means of putting his ideas into practice.

A strong belief "in the voluntary co-operation of a people in contrast to any system of compulsion"⁵ led St Barbe to meet other foresters at the 1926 First World Forestry Congress to discuss future strategies. Following this conference, St Barbe made a 17,000 mile long survey of American forestry, making records of the extent to which "natural" forests had been cleared, and of the severity of the associated damage. The survey led Roosevelt to create a Civilian Conservation Corps (CCC). After eight years, the CCC had employed and trained over six million men. The CCC saved men from the "erosion of unemployment and enabled them to cooperate with nature".⁶

Throughout St Barbe's "green" campaign, a significant amount of time was devoted to teaching school children about a tree sense. In Bait Vegan, near Palestine, for example, he organised a revival of the "Feast of the Trees", adapted so that four hundred trees could be planted. The ceremony included a procession of four thousand children watched by sixteen thousand people. The scale and religious fashion in which the ceremony was conducted, meant that a sense of awe and humility was associated with the planting. Those children could grow up and see the trees they had planted; the reverence and social implication of the moment led to an instilled bioethic. St Barbe regarded it as important that children—the earth stewards of tomorrow—should at an early age become active in their moral duty towards nature. A junior "Men of the Trees" was established in 1956 and a new American green movement called "Children of the Green Earth" was also created as a result of St Barbe's campaigns.

St Barbe established "Men of the Trees" societies all over the world. All were based on the bioethical principles that the Kikuyu had demonstrated so effectively. In 1924, a Men of the Trees society was established in Britain, where St Barbe tried to mobilise another CCC, entitled the "Landsmen". The attempt failed. Nonetheless, St Barbe set up a school of silviculture in Puncknoll, Dorset. From

here he lectured to army cadets and war veterans on the need for reafforestation. As a pacifist, he regarded the army as useful only if it could become mobilised to carry out large-scale reafforestation.

The Green Front

The Sahara became St Barbe's "special" obsession. He considered it the epitome of man's neglect for nature. In 1953, St Barbe covered 6,000 miles on an ecological survey of the desert and then again in 1964 he trekked 25,000 miles collecting more

"St Barbe believed that the Earth is a sentient being, on which Man lives as a privileged creature. Our privileged position carries with it a duty to nurture and care for Nature."

information as part of his Sahara Reclamation Programme. To encourage greater awareness of the importance of trees, St Barbe instigated world forestry gatherings once a year from 1945-1957 for politicians and diplomats. The aim was to encourage international as well as grass-root co-operation, the net result of which was a "New Earth Charter". A brief of this is found in St Barbe's book, *Green Glory, Forests of the World*.⁷ The charter appeals to nations everywhere to recognise their moral duty towards nature and reafforestation. It emphasises that success can only be achieved if the indigenous populations are allowed to participate. "We believe they will put into their work not merely their hands and their feet, but their brains and their hearts. Each can experience the transcendental joy of creation, and can earn immortality and bestow immortality." The charter points out that history so far has witnessed man "disregarding the Divine Law and the Laws of Nature, to his own undoing. In his pride, he has rampaged over the stage of the earth, forgetting that he is only one of the players put there to play his part in harmony and oneness with all living things."

St Barbe knew it was foolish "to think that a relatively small society of tree lovers like 'Men of the Trees' is trying to reclaim all of the Sahara".⁸ It could only perform its moral duty and

set an example. Wendy Campbell Purdie, a follower of St Barbe, was responsible for a tree planting around the Bou Saada oasis, Algeria. The planting of citrus trees, figs, pomegranates and honey locusts was successful; however, the scheme was criticised for its amateurishness and lack of local involvement. Any bioethical principle was obstructed by the corrupt, supportive charity—Red Crescent.⁹

The "Green Front", as St Barbe's movement was called, proposed a complete encirclement of the Sahara by trees, using oases as areas for nursery production and distribution. These proposals were presented at the 1966 (sixth) World Forestry Congress in Madrid, at the 1972 (Seventh) World Forestry Congress in Argentina and finally at the United Nations Conference on Deserts (UNCOD) 1977. Despite St Barbe's years of single-minded canvassing of politicians, the two million square miles of afforestation hoped for and recommended by the Green Front, has not been achieved. Apparently, the Green Front was regarded as "unscientific" in motive and therefore as unnecessarily alarmist.

Philip Stewart of the Oxford Forestry Institute, and Dennis Owen of Oxford Polytechnic, who attended UNCOD, both met and talked to St Barbe. They both suggest that there was a lack of planning and realism within the Green Front. In addition the conferences were dominated by what O'Riordan would call "technocentrics"—people whose philosophy is the opposite of "ecocentric" in that they recognise environmental problems, yet see the solution in modern science, technology and conventional economics. By contrast the ideology fundamental to St Barbe and the Green Front saw ecological law and the bioethic as paramount.

St Barbe and Sentience

St Barbe was first and foremost an ecocentric romantic. "I believe in the Oneness of Mankind and all living things and the interdependence of each and all." He believed in interdependence, but also that the earth was a sentient being, on the surface of which we live as privileged creatures. That privileged position carries with it a duty to nurture and care for nature. St Barbe used an analogy with the

human body to illustrate his point: "If a man loses one-third of his skin he dies; if a tree loses one-third of its bark, it too dies. If the Earth is a 'sentient being', would it not be reasonable to expect that if it loses one-third of its trees and vegetable cover, it will also die?" It is impossible to refute such a belief. St Barbe's organic, animistic world view has recently been revitalised by James Lovelock.¹⁰ A scientist, Lovelock concluded that in order to best understand the complexities of the Earth's ecosystem, it *should* be regarded as a single living entity. He called his theory "The Gaia Hypothesis", named after the Greek goddess of the Earth.

Such global organicism adds weight to St Barbe's bioethical view of the world, since if something is living and has feeling then, like any other living creature, it should have rights. Moreover, if the biosphere is a living entity, a global ecosystem, this would suggest that its component parts are of equal value and, therefore, again, that they have a right to exist.

Silviculture and the Bioethic

St Barbe does not actually use the word "ecosystem", but nonetheless it is a concept which pervades much of his writing. He often referred to the earth as a "society of living things whose value depends on its capacity to renew itself".¹¹ He believed that to perpetuate the indigenous forests called for the discovery of "nature's secret".

Silviculture is the practice of sustainable forestry. It involves attempting to work with nature's law, rather than against it. As such it is opposed to forestry that depends on large scale clearance, and does not replant where it has cut. Agri-silviculture in Hart and Douglas's words "defines all plant culture and even livestock keeping as part of one whole biological cycle, looking upon each farm unit as a progressing entity."¹² Silviculture or agri-silviculture enables man to use the forest for his own ends, yet the forest maintains its capacity to renew itself. This is bioethical: man's infringement of the earth's rights are kept to a minimum.

St Barbe believed that a greater understanding and appreciation of trees would mean that more of them would be planted; this should in turn



Planting trees to halt the spread of the desert. For St. Barbe, the Sahara epitomised Man's neglect for Nature.

lead to a greater reliance on them, producing an economy with an increased silvan base and, therefore, a sounder ethic binding man and nature. St Barbe lived on "nuts, dates, raisins and raw onions".¹³ He enjoyed a healthy life right up to the age of 92. He was living proof that a person can survive on the fruits of trees and little else. Silvan products were regarded by St Barbe as "foods direct from the plant kingdom". Their production poses the least threat to the plant's existence; the plant continues to thrive yet it has provided nourishment, it is thus entirely ethical and non-exploitative to nourish oneself in this way. Moreover, St Barbe argued that since grain, fruit and vegetables require only one tenth of the area now used for livestock production, and since eating meat leads to violence and war,¹⁴ the practice of bioethic leads to a sustainable and peaceful existence of human societies.

The Bioethic and Romanticism

St Barbe's philosophy was not new. His approach strongly echoes that of the Romantics who were also imbued with the bioethical spirit. Thoreau, for example, wrote often on "nature's animate beauty". One night, whilst camped on the shore of Moosehead Lake in 1857, he wrote "woods are not tenantless, but choke-full of honest spirits as good as myself any day, not an empty chamber in which chemistry was left to work alone, but

an inhabited house."

The idea of a bioethic also has roots in medieval science, which recognised that all things on earth were linked in a "Great Chain of Being". Within this hierarchy, which went from God at the top to mud and slime at the bottom, there was a social and cosmic order, representing the state to which nature tended to return after it had been disturbed. There was a place for everything and everything knew its place; all plants, including trees, had as much right to a place in the chain as anything else. This was an animate world, and observed as an organic system.¹⁵ Without doubt St Barbe himself was an animist, yet he was also a Baha'in; one who believes in the unity of all major religions, and a vociferous believer in God. Animism and religious faith, in his opinion, need not be an incongruous duo, nor a contradiction.

With the advent of Cartesian and Newtonian thought, nature became an object of rational scientific scrutiny, it was treated as a machine, a machine that could be and should be exploited. The age of technocentricity had begun. In opposition to this new paradigm stood the early Wilderness Movement embodied by such environmentalists as Emerson, Wordsworth and Thoreau. They upheld the belief in the "organic" view of the world, refusing, like St Barbe did later, to accept the logic behind the development of the new technology

and the path that it was taking. Earlier still, people like John Evelyn warned as far back as 1664 that "we had better be without gold than without trees". Evelyn's book *Silva* is not only a call for a more careful economic handling of our wood resource but a long discourse on the integral, animate beauty of Britain's trees. In effect, it is advocating that trees should have a right to exist.

The romantic-transcendental view

The Men of the Trees

The "TREE 2000" appeal aims to provide one of the long term solutions to the tragedy of the starving in North Africa.

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of the Wilderness Movement was at its strongest in America. Nature was seen as something untainted by man. As such, it was a medium through which communication with God could be sought. Managerial conservationists, like Pinchot were "unGodly" and regarded as "philistines obsessed with machinery."¹⁶ John Muir and Aldo Leopold were two foresters involved in this transcendental wilderness movement and like St Barbe they both advocated a "land ethic", that is, they saw the need to "harmonise our machine civilisation with the land from whence comes its sustenance."¹⁷

Muir believed that ordinary people increasingly wanted to embrace the idea and practice of the bioethic as expressed in romantic transcendentalism. "Thousands of tired, nerve-shaken, over-civilised people are beginning to find out that going to the mountains is going home; that the wilderness is a necessity and that mountain parks and reservations are useful not only as fountains of timber and irrigating rivers, but as fountains of life."¹⁸ To further the interests of nature (the simultaneous benefits to man cannot be ignored), Muir established the Sierra Club in 1892. Years later, in 1969, the Sierra Club spawned an offshoot organisation: Friends of the Earth (FoE).

Friends of the Earth

St Barbe devoted his life to increasing tree sense at both the international and, by his work with NGOs, at the grass-roots level, thus reducing deforestation. Afforestation is the main aim of the current FOE Tropical Rainforest Campaign (TRFC), which also receives the help and backing of the still-existent Men of the Trees society. FoE's campaign is concerned with ensuring the sustainable use of the tropical rainforests, for which the implementation of silviculture is recommended. As its name suggests, FoE aims to create a world that is more bioethically minded, in which people live in ethical harmony with nature—their source of income. The campaign's ideas and practices are thus very similar to those of St Barbe. Coincidentally, the slogan of the TRFC—"Forests or Famine"—echoes St Barbe's chapter "Tree or Famine" in *Green Glory: Forests of the Earth*.¹⁹

Yet there are also major differences

between St Barbe's campaign and FoE's. First, despite its ecocentric chairman, Jonathon Porritt, FoE's underlying principle is that the rights of nature are particularly to be recognised when man is endangered; this is more of a utilitarian notion than the ethical argument propounded by St Barbe. The second obvious difference lies in FoE's size and political influence. FoE has 28,000 members in Britain alone, with offices in another 26 countries. It is a highly bureaucratic body which carries weight in the political arena. By comparison, St Barbe's campaign was dependent on a few personalities and limited funding. It was also, perhaps, "before its time" in that the current wave of public interest in environmental issues had yet to develop.

Thirdly, FoE, despite the inclinations of some of its individual members, has an overall scientific and "objective" character; it works directly within the technocentric world it seeks to change. In its Tropical Rainforest Campaign, the aesthetic, ethical argument has gone out of the window and in its place is an emphasis on the "usefulness" of the species that are now extinct or endangered. If conserved, it is argued, these species could be used for the betterment of mankind, in medicine, for example. The notion of rights may be accepted as real, but unlike St Barbe's campaigns, FoE does not apparently regard such rights alone as a genuine basis for conservation.

The notion of rights is thus generally not given serious thought because of its lack of scientific credentials. The Woodland Trust, the Men of the Trees, Green Deserts and Desert 2000 are four examples of organisations all working closely with each other and based on ethical motives; there is no evidence to suggest that in the contemporary world, such a motive damages reputation.

The romantic aspect of St Barbe's philosophy should certainly be a bigger feature of the FoE campaigns. Perhaps FoE could look to, and learn from, other aspects of St Barbe's campaigns, such as the involvement of children. The idea of agri-silviculture is another area of interest; perhaps we should be looking towards a culture which involves the consumption not only of timber, but also a wider range of foodstuffs and raw materials sup-

plied by trees. In a time of high unemployment, a greater involvement in nature conservation makes sense, a greater respect for the corps of conservationists in the world should be instigated.

Greenpeace

Greenpeace, though it has no specific reforestation campaigns, generally takes a stance similar to that of St Barbe. It is characterised by what appears to be swashbuckling, direct action in defence of nature's rights. Greenpeace represents an organisation that values itself as much as the whale or tree that it attempts to protect. In Switzerland, for example, in response to the announcement of tree clearance for yet another new ski-lift, members chained themselves to the marked trees. The motive was and is emotive; as human beings they regard destroying for profit as unnecessary, especially if the survival of the species being ravaged is threatened. Greenpeace's actions have received media attention, forcing people to become aware of nature's rights. As a result, Greenpeace has become unpopular with the corporations responsible for environmental abuse.

St Barbe himself was no stranger to controversy. In 1976, he led a campaign to save the redwoods, stirring up so much emotion that a former president of the Sierra Club said "he had never before seen so much hatred directed at one man". International media coverage, similar to that which follows Greenpeace, would have created a wider reaction; St Barbe's name might have received world press attention, more people as a result might have got to read about him.

St Barbe failed to achieve credibility within his profession and within the political arena because his motives were judged to be emotive not scientific. Despite this, however, St Barbe's "unscientific" approach should not be discounted. While Greenpeace is increasingly scientific in its method—using its boat *Beluga* as a floating laboratory to analyse water samples taken around the coast of Britain—it at the same time does not hide its romantic, intuitive roots. The whole *raison d'être* for this action group, for example, is based on an old North American Cree legend. According to the legend, Eyes of Fire saw a pois-

oned future, near to losing its spirit as a result of man's technology. She predicted that a small group of people from all races of the world would gather under a rainbow and be taught how to revere Mother Earth. These people were called "Warriors of the Rainbow". Likewise the Chipko Movement in the Indian Himalayas finds its roots in the biocentric example of Vishnois martyrdom.

Romance in environmentalism can be used to good measure, it is a capacity for a true concept of history, enabling us to see our mistakes and create a world that will not destroy itself. Linked with this is the power to make future generations part of the present. It is a means of instilling a sense of reverence and adoration for nature and life.

Conclusion

The desire for an environmental ethic, or bioethic is fundamental to the philosophy of St Barbe: this places him within the ecocentric and romantic stream of environmentalism. His decision to try and enclose the Sahara with trees—without any genuinely successful political agreement—and his failure to measure the "scientific" chances of such a scheme succeeding was, to use the phrase with which Boyd Orr described Miss Campbell Purdie's efforts, "crazy but commendable".²⁰ The idea of a Sahara enclosure, let alone St Barbe's proposition that Man has a moral duty towards nature, was seen by those in power as lunatic. The Sahara proposal was seen as the culmination of St Barbe's life's work and also perhaps as the most damaging advertisement for his philosophy. It is my opinion that had such a "Green Front" taken place today with such an eccentric like St Barbe at its head, then the increased environmental awareness that exists today would not have allowed such a rebuff.

St Barbe argued that science is commonsense.²¹ Commonsense, he felt was rational and "scientific" because it needs no deliberate investigation or technical articulation: it is instinctive. If one can accept such reasoning then scientific method need not always be rational, it can be romantic. Others, such as Lovelock, argue that in romance is science: if intuition can contribute to an

interpretation of a problem which increases understanding of that problem, then in a similar way, foresight of a path towards a sustainable quality of life can also be gained. If such "scientific" method is justified, St Barbe's practice as well as his ideas should be given greater consideration.

St Barbe essentially represents the romantic side of environmentalism and just as Greenpeace's co-existence with FoE adds a new perspective to the environmental movement, so St Barbe's approach—using romantic, bioethical ideas in the practice of tree conservation—could usefully be extended to a wider range of environmental issues today.

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Photo: Bernard Jacobson

Shiva and Pavati. Trees and forests have always featured prominently in Indian mythology.

Chipko: Rekindling India's Forest Culture

by Jayanta Bandyopadhyay and Vandana Shiva

Forests have been central to the evolution of Indian civilisation, India being known in ancient times as "Aranya Sanskriti" or a "forest culture". Under British rule, however, forestry became commercialised. The access of peasants to the forests was restricted and management practices aimed at maximising timber output were introduced. This led to widespread satyagrahas — campaigns of non-violent civil disobedience — being organised throughout India in defence of forest rights. The modern Chipko Movement is the natural heir to those early protest movements. Today, however, the focus of the forest rights campaign has shifted. The critical problem no longer revolves around who should be allowed to exploit the forests but how India's forest wealth can be restored. Environmental issues have now moved centre stage and, in the process, Chipko has become truly 'Green'.

The conflicts and tensions which led to the emergence of the Chipko Movement can be traced historically to the drastic changes in forest management introduced into India during the colonial period. Traditionally, large tracts of natural forests were maintained through careful husbanding by local communities; village forests and woodlots were also developed and maintained through the deliberate selection of appropriate tree species. Remnants of communally managed natural forests and village commons still exist in pockets and these provide illuminating insights into the scientific basis underlying traditional land management in India.¹

The forest management practices introduced by the British undermined the traditional conservation strategies in two ways. Firstly, changes in land tenure, such as the introduction of the zamindari system, transformed common village resources into the private property of

newly created landlords; in many areas, this led to the destruction of village forests. No longer able to satisfy their domestic needs from the village forests, villagers were forced to exploit the natural forests. Secondly, the natural forests themselves were logged on a large-scale to satisfy the demands of outside commercial interests: many trees were felled to build ships for the British Royal Navy or to provide for the expanding railway network in India.

After about half a century of uncontrolled exploitation, the need for control slowly became apparent. The response of the British was to set up a new bureaucracy responsible for the forests and to create "reserve forests" to which access was restricted. However, the actions of the colonial Government were inspired less by ecological concerns than by financial ones. Forest conservancy was directed at the conservation of forest revenues and not at the forests themselves. This generated severe conflicts at two levels. The new management system catered only to commercial demands and ignored local basic needs. People were denied their traditional rights to the forests, although in some cases,

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they were re-introduced as concessions and privileges after prolonged struggles.² At the conservation level, since the new forest management was only concerned with stable forest revenues and not with the stability of forest ecosystems, ecologically unsound silviculture practices were introduced. This undermined the biological productivity of forest areas and transformed renewable resources into non-renewable ones.³

The reservation of forests and the denial of the villagers' rights of access led to local opposition in all parts of the country. The Forest Act of 1927 intensified the conflicts and the 1930s witnessed widespread Forest *satyagrahas*—that is, non-violent protests in the pursuit of truth and justice—against the new forest laws and policies.

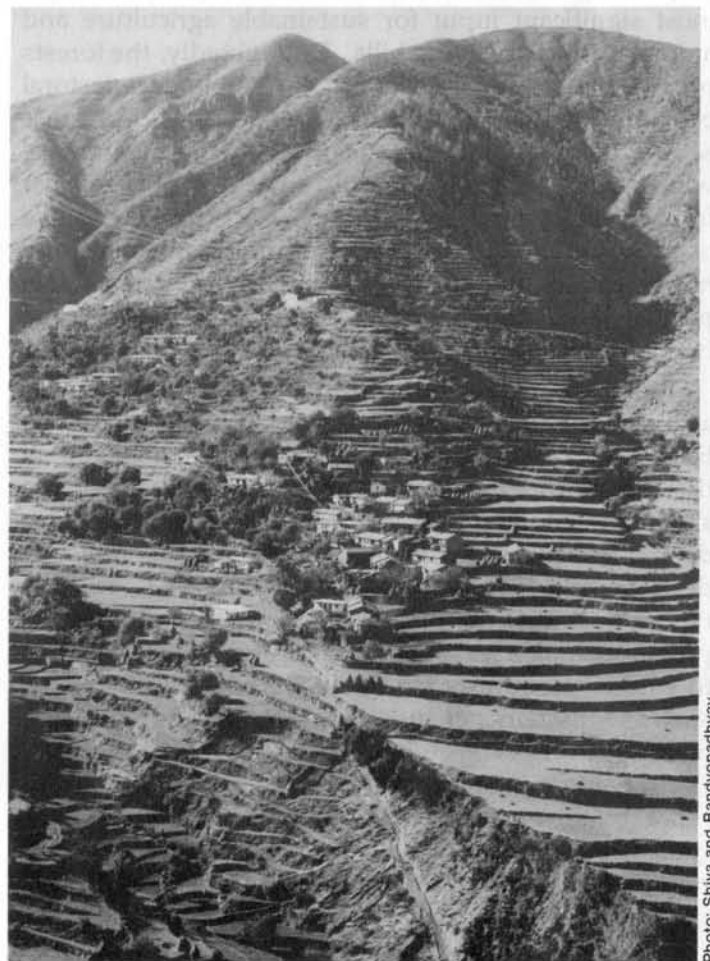
Satyagraha and Chipko

Satyagraha, in the form of non-cooperation, is a traditional mode of protest against exploitative authority in India. In *Hind Swaraj*, Gandhi wrote that through *satyagraha* he was merely carrying forward an ancient tradition: "In India the nation at large had generally used passive resistance in all departments of life. We cease to cooperate with our rulers when they displease us."

Satyagrahas were used by Gandhi to protest against the material exploitation caused by the pursuit of profits—the root cause, he believed, of the material underdevelopment of the Indian masses. *Satyagraha* was used in Champaran to save Indian peasants from the compulsory cultivation of indigo in place of food-crops. It was used in Dandi, and in other parts of the country, to protest against the exploitative Salt Law. It was used to safeguard the interests of the Indian weavers who were pauperised by the unequal competition with mill-made cloth from Europe. And it was used by forest movements to resist the denial of traditional rights.

With the introduction of the Forest Acts of 1878 and 1927, the access of villagers to forests, and their rights to forest products, were severely curtailed. The following years witnessed the spread of forest *satyagrahas* throughout India in protest against the setting up of "reserve" forests for exclusive exploitation by British commercial interests, and the concomitant transformation of a common resource into a commodity. Villagers ceremonially removed forest products from the reserved forests to assert their right to satisfy their basic needs. The forest *satyagrahas* were especially successful in regions where the survival of the local population was intimately linked with access to the forests, as in the Himalayas, the Western Ghats, and the Central Indian hills. These non-violent protests were suppressed by the British. In Central India, Gond tribals were gunned down for participating in the protests. On May 30th, 1930 dozens of unarmed villagers were killed and hundreds injured in Tilari village, Tehri Garhwal, when they gathered to protest against the Forest Laws of the rulers in Tehri. After enormous loss of life, the *satyagrahas* were successful in reviving some of the traditional rights of the village communities to various forest products.⁴

Despite such successes, however, the guiding



Hill village in Garhwal. Pressure on land for food and firewood has drastically reduced the tree cover of the region.

principle of British forest management in India remained the maximisation of revenues. Little thought was given to the ecological needs of the forest or the needs of villagers. That emphasis on financial objectives has continued to direct forest management in contemporary India, the only difference being that financial goals are pursued even more ruthlessly than under the British, since the forests are now being managed "in the national interest" and in the pursuit of "economic growth". The cost of achieving this growth has been the destruction of forest ecosystems and huge losses to the nation through floods and droughts. In ecologically sensitive regions, such as the Himalayas, this destruction has threatened the survival of the forest-dwelling communities.

The people's response to this deepening crisis has taken the form of a non-violent Gandhian resistance movement: the Chipko Movement. Beginning in the early 1970s in the Garhwal region of Uttar Pradesh, the message and tactics of Chipko have now been taken up by villagers in Himachal Pradesh in the north, Karnataka in the south, Rajasthan in the west, Orissa in the east, and the Vindhya in Central India.⁵

Early Forest Movements in Garhwal

Forest resources are the critical elements in the vulnerable Himalayan ecosystem. The natural broad-leaved and mixed forests have been critical to maintaining water and soil stability under conditions of heavy seasonal rainfall. They have also provided the

most significant input for sustainable agriculture and animal husbandry in the hills. Undoubtedly, the forests provide the material basis for the whole agri-pastoral economy of the hill villages. Green leaves and grass satisfy the fodder requirement of the farm animals, whose dung provides the only source of nutrients for food crops. Dry twigs and branches are the only source of domestic cooking fuel. Agricultural implements and house frames require forest timber. The forests also provide large amounts of fruit, edible nuts, fibres, and herbs for local consumption.

During the nineteenth century, a third demand was also put on the forest resources of Garhwal. In 1850 an Englishman, Mr Wilson, obtained a lease to exploit all the forests of the Kingdom of Tehri-Garhwal for the small annual rental of 400 rupees. Several valuable deodar and chir forests were clear-felled and completely destroyed.⁶ In 1864, inspired by Mr Wilson's flourishing timber business, the British rulers of the northwestern provinces took a lease for 20 years and engaged Wilson to exploit the forests for them. European settlements, such as Mussoorie, created new pressures for farmland, leading to the large-scale felling of oak forests. Conservation of the forests was not considered. In his report on the forests of the state, E.A. Courthope, of the Indian Forestry Service (IFS), remarked: "It seems possible that it was not mainly with the idea of preserving the forests that government entered into this contract".⁷ In 1895, Tehri State took over the management of its forests, having seen the economic returns achieved by Mr Wilson and the British colonial administration. Between 1897 and 1899, forest areas were reserved and restrictions were placed on their use by villagers. The restrictions, which were much disliked (although utterly disregarded) by the villagers, led to cases of organised protests against the authorities.⁸ In response to those protests, the King of Tehri-Garhwal announced a Durbar circular (No. 11) modifying restrictions on March 30th 1905.

The modification, however, failed to diffuse the tension. Small struggles took place throughout the kingdom, but the most significant resistance occurred in 1907 when a forest officer, Sadanand Gairola, was man-handled in Khandogi. When King Kirti Shah heard about the revolt, he rushed to the spot to pacify the citizens.⁹

The contradictions between the people's basic needs and the State's revenue requirements remained unresolved and, in due course, they intensified. In 1930, the people of Garhwal began a non-cooperation movement, mainly around the issue of forest resources. *Satyagraha* to resist the new oppressive forest laws was most intense in the Rewain region. A massive protest meeting was organised at Tilari. The King of Tehri was in Europe at the time. In his absence, Dewan Chakradhar Jayal, crushed the peaceful *satyagraha* with armed force. A large number of unarmed *satyagrahis* were killed and wounded, while many others lost their lives in a desperate attempt to cross the rapids of the Yamuna River. While the right of access to forest resources remained a burning issue in the Garhwal Kingdom, the freedom movement in India invigorated the Garhwali people's movement for democracy. Saklana, Badiyar-

garh, Karakot, Kirtinagar, and other regions revolted against the King's rule in 1947 and declared themselves independent *panchayats*. Finally on August 1st 1949, the Kingdom of Tehri was liberated from feudal rule and became an integral part of the Union of India and the State of Uttar Pradesh.

The heritage of political struggle for social justice and ecological stability in Garhwal was strengthened in post-independence India with the influence of eminent Gandhians, such as Mira Behn and Sarala Behn.

The Gandhian Tradition

The Chipko Movement is historically, philosophically and organisationally, an extension of traditional Gandhian *satyagrahas*. Its special significance is that it is taking place in post-independence India. The continuity between the pre-independence and post-independence forms of this *satyagraha* has been provided by such eminent Gandhians as Sri Dev Suman, Mira Behn and Sarala Behn. Sri Dev Suman was initiated into Gandhian *satyagraha* at the time of the Salt *satyagraha*. He died as a martyr for the cause of the Garhwali people's rights to survive with dignity and freedom. Both Mira Behn and Sarala Behn were close associates of Gandhi. They both moved to the interior of the Himalayas and established *ashramas*. Sarala Behn settled in Kumaun and Mira Behn lived in Garhwal until late in her life, she left India for Vienna, due to ill-health. Imbued with the Gandhian world-view of development based upon justice and ecological stability, Mira Behn and Sarala Behn made a major contribution to the growth of ecological consciousness in the hill areas of Uttar Pradesh, and to raising the status of women in the region. The influence of these two European disciples of Gandhi on the struggle for social justice and ecological stability in the hills of Uttar Pradesh has been immense. Indeed, it was they who generated a new brand of Gandhian activists who provided the foundation for the Chipko Movement.

Sunderlal Bahuguna is prominent among the new generation of workers deeply inspired by Mira Behn and Sarala Behn. Influenced by Sri Dev Suman, he joined the Independence movement at the age of 13. Now, at nearly 60, he is strengthening the philosophical base of the Chipko Movement with a Gandhian view of nature. Chipko's rapid spread in the hills of Uttar Pradesh and its success in enforcing changes in forest management also owes much to the awareness created by folk poets, such as Ghanshyam Raturi, and to the efforts of a number of activists, such as Man Singh Rawat, Chandi Prasad Bhatt, Dhoom Singh Negi and many others. Bhatt, who later became very well known through his work, was inspired by Bahuguna to leave his job as a booking clerk in a transport company to become a full-time social activist. Bahuguna met Bhatt in 1960 in Nandprayag when on a trip through Uttarakhand to spread Gandhi's message in Uttarakhand, on the advice of Acharya Bhawe.

Chipko Today

After Independence, the Gandhian movement in Garhwal organised itself under Sarala Behn into an Uttarakhand Sarvodaya Mandal. The Sarvodaya move-

Sunderlal Bahuguna, one of the best known Chipko activists. Deeply influenced by Mahatma Gandhi, he has brought a Gandhian view of nature to Chipko, emphasising the ecological importance of restoring forest cover to the Himalayas.

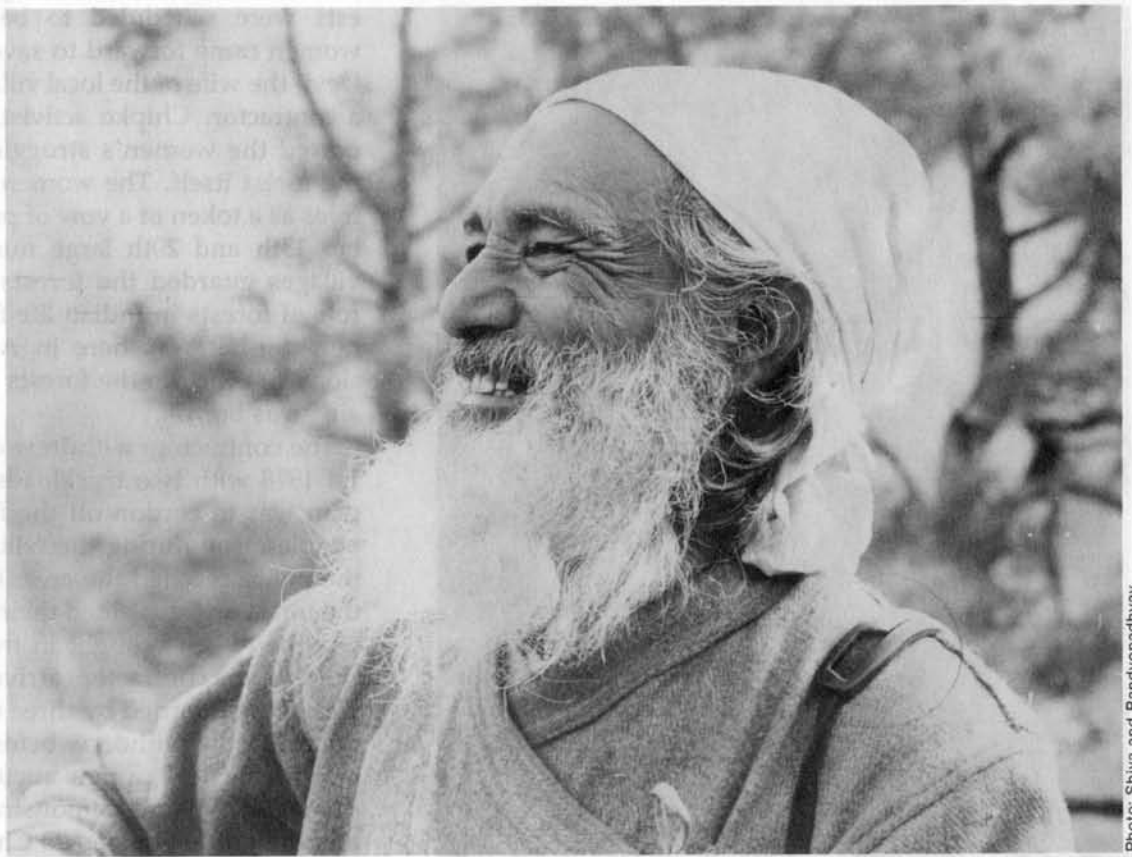


Photo: Shiva and Bandyopadhyay

ment, in the 1960s was organised around four major campaigns:

- The organisation of local women;
- Fighting against the consumption of alcohol;
- The fight for forest rights;
- The setting up of local forest-based small industries.

While the fight against alcohol consumption provided the platform for the organisation of women—many of whom had suffered at the hands of drunken husbands—the increasing conflict between local and outside industries over forest products provided the rallying point for popular protest during the 1960s. On May 30th 1968, the people in Garhwal renewed their resolve to fight for the forests in a memorial meeting at Tilari.

By the 1970s, local women's groups were already well organised. The last decade saw the beginning of more frequent and more vocal popular protest for the right to utilise local forests. In 1972, Swami Chidanand of Rishikesh undertook a month-long tour to bless the people in their struggle. In his talks, he brought together the spiritual message of Indian culture with the scientific ideas of western ecology which had emerged after the Stockholm Conference. The most widespread organised protests against the commercial exploitation of the Himalayan forests by outside contractors took place in Purola on December 11th 1972, in Uttarkashi on December 12th and in Gopeshwar on December 15th. It was during these protest meetings that Raturi composed his famous poem describing the method of embracing the trees to save them from felling:

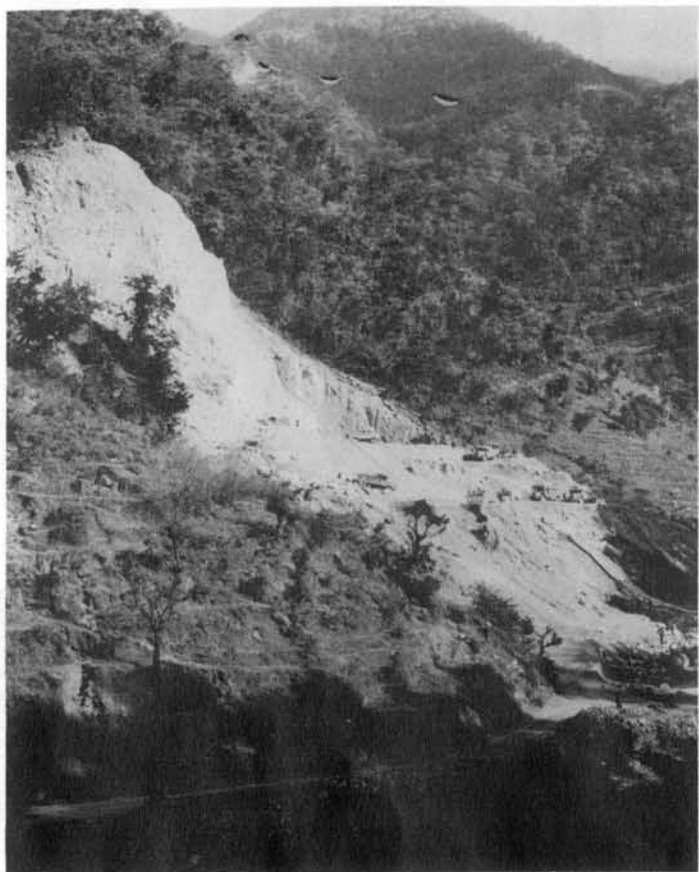
Embrace the trees and
Save them from being felled;
The property of our hills,
Save them from being looted.

Although the concept of saving trees from felling by embracing them is old in Indian culture—the most famous incident being the self-sacrifice of 363 Bishnoi villagers in order to save their Khejri trees from being felled by the King of Jodpur¹⁰—Raturi's poem is the first documented use of the word 'chipko' (Hindi for 'to embrace') in the context of the modern forest rights movement.

The Movement gets under Way

In 1973, the tempo of the movement in Uttarkashi and in Gopeshwar, under the leadership of Raturi and Bhatt, began to hot up. In April, the first popular action to chase away contractors took place spontaneously when villagers from the Gopeshwar region demonstrated against the felling of ash trees in Mandal forest. After this success Bahuguna and his colleagues immediately started a march in Chamoli district, following the loggers and encouraging people to oppose them wherever they went. Later in the year, in December, there was a militant non-violent demonstration in Uttarkashi, in which thousands of people participated. In March 1974, 27 women under the leadership of Goura Devi saved a large number of trees from contractors in Reni. After this, the government was forced to stop the private contract system of felling and, in 1975, formed the Uttar Pradesh Forest Corporation to do the job instead. This was the first major success of the movement and marks the end of a phase in itself. A major tool for creating public awareness in this success was *padayatras* or "foot marches". The famous Askot to Arakot march in 1973, and the 1975 march of such women activists as Vimala Behn, Radha Behn and Shashi Behn are important to mention.

From its inception, the new Forest Corporation took



Deforestation is not the only cause of ecological destruction in the Himalayas. Limestone quarrying and road building have also taken their toll on the region's fragile environment.

little account of the ecological limits to forest extraction. The creation of the corporation thus did little to relieve the burden of local women, who are responsible for collecting fodder and water. Increasingly, therefore, Chipko began to go beyond its initial demands for a higher allocation of forest products to local industries and to insist instead on proper ecological control over forest products. Only this, it argued, would ensure dependable and sustainable supplies of water and fodder.

In May 1977, Chipko activists in the Henwal Valley organised themselves for future action. In June 1977, a meeting of all the activists in the hills, together with intellectuals like Shri D.D. Pant, was held in the Ashram of Sarala Behn further strengthening the movement and consolidating resistance to commercial fellings as well as excessive tapping of resin from the chir pine trees. In Gotars forest in the Tehri range, the forest ranger was transferred because of his inability to control illegal over-tapping of resin. In the Jogidanda area of Saklana range, the public sector corporation, Garhwal Mandal Vikas Nigam, was asked to regulate its resin-tapping activity.

Saving the Adwani Forests

In October 1977, the Adwani forests were auctioned in Narendernagar, the district headquarters of the Forest Service. Bahuguna undertook a fast against the auction and appealed to the forest contractors and the district authorities to refrain from auctioning the forest. The auction was undertaken despite popular protest.

In the first week of December 1977, the Adwani for-

ests were scheduled to be felled. Large groups of women came forward to save the forests led by Bachni Devi, the wife of the local village head, who was himself a contractor. Chipko activist, Dhoom Singh Negi supported the women's struggle by undertaking a fast in the forest itself. The women tied sacred threads to the trees as a token of a vow of protection. Between December 13th and 20th large numbers of women from 15 villages guarded the forests, while discourses on the role of forests in Indian life from ancient texts went on non-stop. It was here in Adwani that the ecological slogan "What do the forests bear? Soil, water and pure air" was born.

The contractors withdrew only to return on February 1st 1978 with two truckloads of the armed police. The plan was to cordon off the forest in order to keep the people away during the felling operation. Even before the police reached the area, Chipko volunteers entered the forest and explained their case to the forest labourers who had been brought in from outside the region. By the time the contractors arrived with the police each tree was being guarded by three embracing volunteers. The police hastily withdrew before nightfall.

In March 1978, a new auction was planned in Narendranagar. A large demonstration took place against it and the police arrested 23 Chipko volunteers, including women. In December 1978, a large felling was planned by the public sector U.P. Forest Development Corporation in the Badiyargarh area. The local people instantly informed Bahuguna, who started a fast to death at the felling site on January 9th, 1979. On the eleventh day of his fast, Bahuguna was arrested in the middle of the night and taken to jail. This act only served to strengthen the commitment of the people. Led by the folk poet Ghanashyam Raturi and by Khima Shastri, a well-known priest, thousands of men and women from surrounding villages occupied the Badiyargarh forests. The people remained in the forests and guarded the trees for eleven days, when the contractors withdrew. Bahuguna was released from jail on January 31st, 1979.

A Ban of Green Felling

The cumulative impact of Chipko's sustained campaign to protect the forests was a re-think of the forest management strategy in the hill areas. Chipko's demand for the Himalayan forests to be declared protection forests—instead of production forests for commercial exploitation—was recognised at the highest level. The late Prime Minister, Mrs Indira Gandhi, after a meeting with Bahuguna, recommended a 15-year ban on commercial green felling in the Himalayan forests of Uttar Pradesh.

The moratorium on green felling gave the Chipko Movement breathing space to expand the base of the movement. Bahuguna undertook an arduous 4780 km long Foot March from Kashmir to Kohima to contact the village people of this long Himalayan range and to spread the message of Chipko. At the same time, other activists spread the movement to the other mountain areas of the country.

While Bahuguna extended the base of the movement, Bhatt in Gopeshwar consolidated the gains made by

Chipko by involving local people in a large-scale tree planting campaign. In an area where tree planting had previously been carried out by the authorities with little or no reference to the needs and wishes of the local people, the new wave of tree planting by the Chipko Movement has opened up great possibilities of ecological and economic rehabilitation. Bhatt's work is recognised by all as a shining example of a successful tree planting scheme. The success of the scheme stands in sharp contrast to the record of official programmes.

The Ecological Foundation of the Chipko Movement

Both the earlier forest *satyagrahas* and their contemporary form, the Chipko Movement, have arisen from conflicts over forest resources and are similar cultural responses to forest destruction. What differentiates Chipko from the earlier struggle is its ecological basis. The new concern to save and protect forests through Chipko *satyagraha* did not arise from resentment against further encroachment on the people's access to forest resources. It arose from the alarming signals of rapid ecological destabilisation in the hills. Villages which were previously self-sufficient in food had to resort to food imports as a result of declining productivity. This, in turn, was related to the reduction of soil fertility in the forests. Water sources began to dry up as the forests disappeared. So-called "natural disasters", such as floods and landslides, began to occur in river systems which had hitherto been stable. The Alaknanda disaster of July 1970 inundated 1,000 square kilometres of land in the hills and washed away many bridges and roads. In 1977, the Tawaghat tragedy took an even heavier toll. In 1978, a big landslide above Uttarkashi blocked the Bhagirathi, causing massive floods across the entire valley.

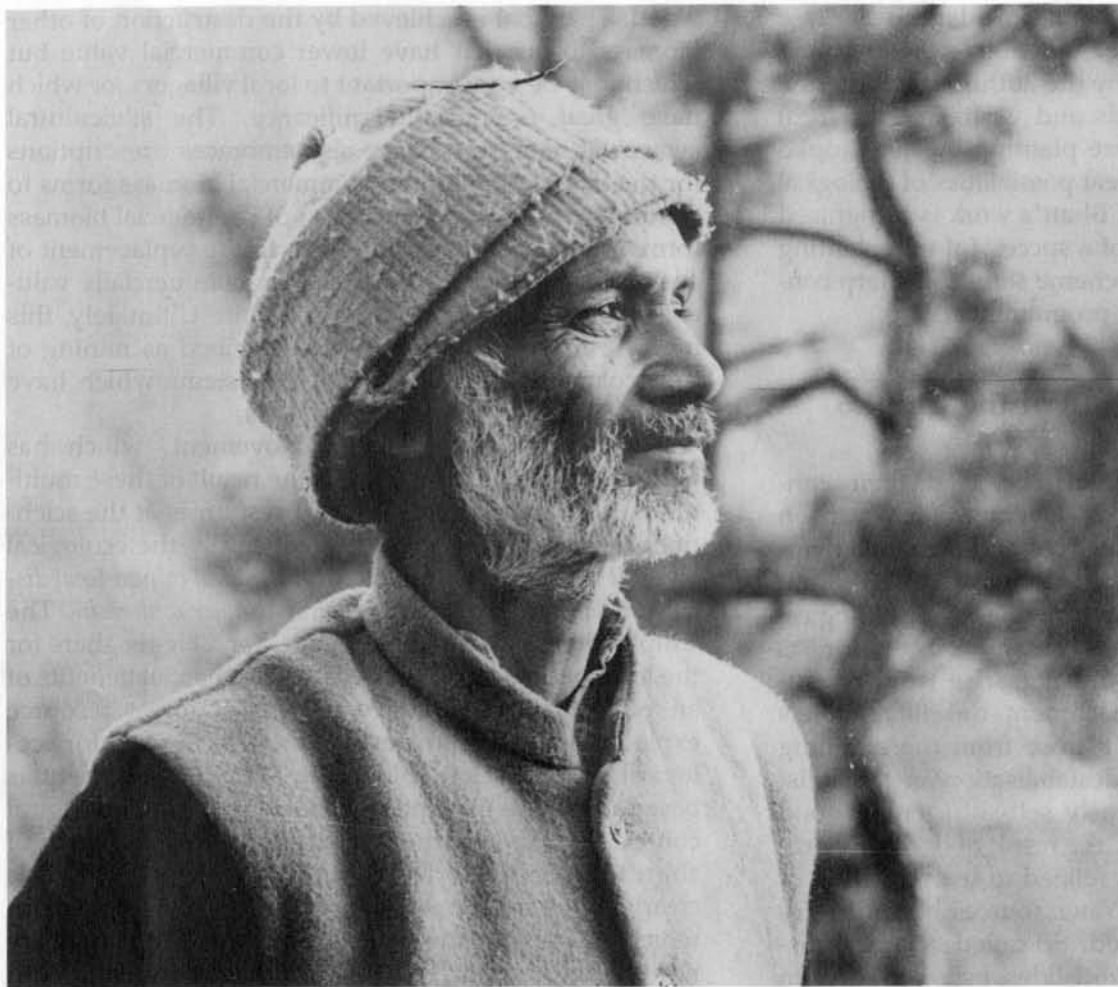
The over-exploitation of forest resources—and the resulting threat to communities living in the forests—caused a shift in Chipko's thinking. Initially, the movement had primarily been concerned with how the material benefits of the forests were being distributed. Now its chief concern became the distribution of ecologically-generated material costs. One can thus see three stages in the development of the Chipko movement and its antecedents. In the first stage, the growth of commercial interests resulted in efforts to exclude competing demands. The beginning of large-scale commercial exploitation of India's forest resources created the need for forest legislation which denied village communities access to forest resources. The forest *satyagrahas* of the 1930s were the result of the Forest Act of 1927, which denied the people access to biomass for survival while increasing biomass production for industrial and commercial growth. The growth imperative, however, drove production for commercial purposes into conflict at the ecological level, thus initiating the second stage of the movement. The scientific and technical knowledge generated by the existing model of forest management is limited to viewing forests only as sources of commercial timber. This gives rise to prescriptions for forest management which are intended primarily to maximise immediate growth of commercial

wood. That goal is achieved by the destruction of other biomass forms that have lower commercial value but which may be very important to local villagers, or which have great ecological significance. The silvicultural system of modern forestry also embraces prescriptions for the destruction of non-commercial biomass forms to ensure the increased production of commercial biomass forms. The encouragement given to the replacement of ecologically valuable oak forests by commercially valuable conifers is an indicator of this shift. Ultimately, this increase in production may be described as mining of the ecological capital of forest ecosystems which have evolved through thousands of years.

The contemporary Chipko Movement, which has become a national campaign, is the result of these multi-dimensional conflicts over forest resources at the scientific, technical, economic, and especially the ecological level. *It is not a narrow conflict over the local or non-local distribution of forest resources, such as timber and resin.* The Chipko demand was, at one stage, for a bigger share for the local people in the immediate commercial benefits of an ecologically destructive pattern of forest resource exploitation. It has now evolved to the demand for ecological rehabilitation. Since the Chipko Movement is based upon the perception of forests in their ecological context, it exposes the social and ecological costs of short term growth-oriented forest management. This is clearly seen in the slogan of the Chipko Movement which claims that the main products of the forests are not timber or resin, but "*soil, water and oxygen*". With appropriate social control, basic biomass needs of food, fuel, fodder, small timber, and fertiliser can, in the Chipko vision and the Garhwal practice, be satisfied as positive externalities of biomass production primarily aimed at soil and water conservation to stabilise the local agri-pastoral economy.

Development vs. Ecology: A false Dichotomy

The Chipko Movement has been successful in forcing a fifteen-year ban on commercial green felling in the hills of Uttar Pradesh, in stopping clear-felling in the Western Ghats and the Vindhyas, and in generating pressure for a national forest policy which is more sensitive to the people's needs and to the ecological development of the country. Unfortunately, the Chipko Movement has often been naively presented by vested interests as a reflection of a conflict between "development" and "ecological concern", implying that "development" relates to material and objective bases of life while "ecology" is concerned with non-material and subjective factors, such as scenic beauty. The deliberate introduction of this false and dangerous dichotomy between "development" and "ecology" disguises the real dichotomy between ecologically-sound development and unsustainable and ecologically-destructive economic growth. The latter is always achieved through the destruction of life-support systems and the material deprivation of marginal communities. Genuine development can only be based on ecological stability which ensures sustainable supplies of vital resources. Gandhi and, later, his disciples Mira Behn and Sarala Behn clearly described how and why



Left, Vishweswar Dutt Saklani. For the past 30 years, Saklani has fought to preserve his own 30-acre patch of forest near the Himalayan village of Satyon from the woodman's axe. More than that, he has personally planted over 20,000 trees — all native species — as a memorial to his brother, killed during the Independence movement. The result is a little oasis of ecological sanity in an area which has been devastated in the name of 'scientific' forestry.

Photo: Shiva and Bandyopadhyay

development is not necessarily contradictory to ecological stability. By questioning the destructive process of growth, ecological movements like Chipko have earned a reputation for obstructing the process of development. In fact, by constantly keeping ecological stability in focus, they provide the best guarantee for ensuring a stable material basis for life for all.

Chipko and the Scientific Basis of Forestry

In the final analysis the dichotomy between "development" and environment boils down to differing views of what "development" involves, and how scientific knowledge is generated and used to achieve it. This dichotomy is very clearly illustrated in two popular slogans, one emanating from the ecological concepts of Garhwali women, the other from the sectoral concepts of those associated with the trade in forest products. Thus the Chipko movement expresses its ecological basis in the slogan:

*"What do the forests bear?
Soil Water and Pure air."*

This is a response to the slogan promoted by the forestry industry:

*"What do the forests bear?
Profit on Resin and Timber."*

The Chipko slogan embodies the scientific and philosophical message of the movement, and has laid the foundations of an alternative forestry science, oriented to the public interest and ecological in nature. Commercial interests have the primary objective of maximising exchange value through the extraction of commercially

valuable species. Forest ecosystems are therefore reduced to the timber of commercially valuable species. "Scientific forestry", in its present form, is a reductionist system of knowledge which ignores complex relationships both within the forest community and between plant life and other resources like soil and water. By ignoring the linkages within the forest ecosystem, this pattern of resource use generates instabilities in the ecosystem and leads to the counter-productive use of natural resources at the ecosystem level. The destruction of the forest ecosystem in turn hurts the economic interest of those groups of society which depend on the diverse resource functions of the forests for their survival. These include soil and water stabilisation and the provision of food, fodder, fuel, fertiliser, etc.

Forest movements like Chipko offer both a critique of reductionist 'scientific' forestry and an articulation of a new frame-work for forestry science which is ecological and which can safeguard the public interest. In this alternative forestry science, forest resources are not viewed as isolated from other resources in the ecosystem. Nor is the economic value of a forest reduced to the commercial value of timber. "Productivity", "yield" and "economic value" are defined in relation to the ecosystem as a whole and for multipurpose utilisation. Their meaning and measure is therefore entirely different from the meaning and measure in reductionist forestry. Just as in the shift from Newtonian and Einsteinian physics, the meaning of "mass" changed from a velocity-independent to a velocity-dependent term, in a shift from reductionist forestry to ecological forestry, all scientific terms are changed from

ecosystem-independent to ecosystem-dependent ones. Thus, while tribals and other forest communities judge the value of a forest in terms of its herbs, tubers, fibres and its genepool, for the forester, these components of the forest ecosystem are useless, unproductive, dispensable. Two economic perspectives lead to two notions of "productivity" and "value".

As far as overall productivity goes, the natural tropical forest is a highly productive ecosystem. Examining the forests of the humid tropics from the ecological view, Golley has noted:

"A large biomass is generally characteristic of tropical forests. The quantities of wood especially are large in tropical forests and average about 300 tons per hectare compared with about 150 tons per hectare for temperate forests."¹¹

However, in the partisan view of "scientific" foresters, the overall productivity is not important. They look only at the industrially useful species and measure productivity in terms of "industrial" biomass alone. Symptomatic of that view is the following statement by Bethel, an international forestry consultant, referring to the large biomass typical of the forests of the humid tropics:

"It must be said that from a standpoint of industrial material supply, this is relatively unimportant. The important question is how much of this biomass represents trees and parts of trees of preferred species that can be manufactured into products that can be profitably marketed . . . By today's utilisation standards, most of the trees, in these humid tropical forests are, from an industrial materials standpoint, clearly weeds."¹²

With forestry science wedded to the interest of the forest industry, it is not surprising that large tracts of natural tropical forests are being destroyed across the Third World. The justification is increased "productivity" but the productivity increase is only in one dimension. Overall there is a productivity decrease. The replacement of natural forests in India with eucalyptus plantations has been justified on the grounds that productivity will be improved. However, it is a one-sided and restricted view of productivity—in this case, the productivity of pulpwood—that is being projected as a universally applicable measure of productivity. What has been called the "Eucalyptus controversy" is in reality a conflict of paradigms, between an ecological approach to forestry on the one hand, and a reductionist, partisan approach which only responds to industrial requirements on the other. While the former views natural forests and many indigenous tree species more productive than eucalyptus, the reverse is true according to the paradigm of Commercial Forestry. The scientific conflict is in fact an economic conflict over *which* needs and *whose* needs are important. In such a clash of paradigms, dominant scientific assumptions change not by consensus but by replacement. Which of the two paradigms becomes dominant is determined by the political strength of their backers.

One Movement: Two Methodologies?

The philosophical confusion generated by taking sectoral growth as synonymous with development has permeated movements like Chipko too. In the absence

of any philosophical clarification of the issues involved, this has led some journalists to seeing a "clash of personalities" in the movement. Increasingly, there are mentions of a "split" in the Chipko Movement and growing tension between the two "streams"—one supposedly headed by Bahuguna and the other by Bhatt.

Undoubtedly, there are serious fundamental differences—as well as some similarities—between the philosophical standpoints of these two very important Chipko activists. Bahuguna believes that development, as practised today in official programmes, is going to be unsustainable if ecology is not considered as an imperative. Accordingly the ecological rehabilitation of the Himalayan regions, the source of the major rivers, has become his first priority. The material foundation of economic development, as Bahuguna believes, cannot be divorced from the productivity of ecological systems and their stability. Thus, Bahuguna maintains economic development in the Himalayas must be based on an expansion of trees and not agriculture.

Though the philosophical standpoint of Bhatt is not well articulated, he strongly favours the introduction of modern development in the Himalayas.¹³ Bhatt firmly believes that the acceptance of present modes of resource use—but with a new emphasis on the location of manufacturing activities in the hill areas and a strengthening of their raw material base—will lead to development and accelerate the fight against poverty. Underpinning this view is a model of development which explains poverty as the absence of processing industries and recommends solutions in technology transfer. Poverty is seen by Bhatt as having a technological solution, in contrast to Bahuguna who sees the solution to poverty in the ecological rebuilding of the productivity of natural resources. For Bahuguna, material benefits arise from lowering the ecological costs due to resource destruction and the increasing productivity of natural and man-made systems. For Bhatt, material benefits are not directly seen in the conservation of essential ecological processes, and productivity is defined in the terms of the classical concept in industrial management, through the technological productivity of labour alone. In this respect Bhatt's model is easily subsumed by the dominant development paradigm—albeit with environmental adjustments. The development prescription is that with the help of modern scientific knowledge, the instruments of production are improved and the standard of living is raised.^{14,15}

In short, the difference between the two activists of Chipko is not unexpected and is universally faced as the difference between deep ecology and environmentalism. It is a difference that is inevitable in any serious ecology movement and has nothing to do with personalities as is commonly made out. The programme of ecological development as propounded by Bahuguna requires a serious change in consumption patterns and the reorganisation of interest groups in society. The programme of Bhatt, however, can be realised within the present social structure and commonly goes under the name "eco-development". The two activists are continuing to work whole-heartedly in their own programmes and there is hardly any overlap or friction between them.

The other major difference between them arises from their work strategies which are complementary, not contradictory. Bahuguna believes in spreading the idea of ecological development in all parts of India, since his model requires a fundamental change in public opinion and political alignments at the national level. He has not been a "grass-roots activist" in the narrow sense of the term, though he has created grass-roots activists in all parts of the country. On the other hand, Bhatt, who is himself a shining example of the activists generated by Bahuguna, believes in concentrating his efforts in his region of influence and working towards consolidation. This has its own positive side. The issues of awareness at the national level and the question of a new ideology of development based on ecological stability is much less prominent in Bhatt's immediate programmes. It is based on the hope that one successful example may open the flood gate of similar projects elsewhere.

The difference between the methods of Bhatt and Bahuguna have often been described, somewhat naively, as the difference between "activism" and "populism".¹⁶ This is mischievous and deflects attention from the very real differences in philosophies of development, technology policy, democratic values, self-help and survival strategies, concepts of productivity and efficiency, which are of extreme significance and which need serious analysis.

Chipko and the Ecological Imperative

Resource use in India has been dominated by the overriding goal of maximising economic growth. This has been achieved through increasing the productivity of labour alone. In the ecological view, such a strategy is counter-productive at two levels. At the resource level, it consumes more resources to produce less useful goods. At the human level, it displaces labour in a society where there is already a surplus of labour, thus destroying livelihoods instead of creating them. Gandhi high-lighted the fallacy of increasing labour productivity without taking into account the social and material context of growth. Gandhi's followers in the Chipko Movement continue to criticise restricted notions of productivity. It is this concern with resources and human needs that is captured in Bahuguna's well-known slogan that "ecology is permanent economy".

The urgent need to establish a new economy of permanence based on ecological principles is underlined by the critical ecological role played by the Himalayan region, each environmental disaster spelling destruction throughout the Ganges basin.

Chipko's search for a strategy for survival has global implications. What Chipko is trying to conserve is not merely local forest resources but the entire life-support system, and with it the option for human survival. Gandhi's mobilisation for a new society, where neither man nor nature is exploited and destroyed, was the beginning of this cultural response to the threat to human survival. Chipko's agenda is the carrying forward of that vision against the heavier odds of the contemporary crisis. Its contemporary relevance, and its significance for the future is clearly indicated in the rapid spread of the ecological world-view throughout the Himalayas

and other parts of India, following the historical 5,000 kilometre trans-Himalaya Chipko foot-march led by Bahuguna, and subsequent foot marches through other vulnerable mountain systems such as the Western Ghats, Central India, and the Aravallis.

Since the ecological crisis threatens survival irrespective of the industrial status of societies, the philosophical significance of re-directing development onto an ecologically sustainable path relates to the industrialised North as much as to countries of the South. This is why the ecological strategy of Chipko finds new adherents in European countries such as Switzerland, Germany and Holland. The spread of the message of an alternate world-view is crucial to the creation of a sustainable world, particularly in the context of a highly integrated global economic system. The ecological world-view of Chipko—the civilisational response of India—provides a strategy for survival not only for tiny villages in the Garhwal Himalayas, but for all human societies threatened by environmental disasters.

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Programme Slashed in Response to Transmigration Campaign

by Marcus Colchester, Survival International

*With the economy groaning as oil revenues fall to less than half those expected, the Indonesian Government has announced massive cuts in its controversial Transmigration Programme. The target for the numbers to be relocated in 1987 has been cut from some 100,000 families to only 1,000. The decision, which reflects a reaction to the criticism of the programme made in *The Ecologist* (Vol. 16, No. 2/3, 1986), provides a major opportunity for western funding agencies to reconsider their support for the resettlement programme.*

In May 1986, *The Ecologist*, in collaboration with the human rights organisations Survival International and Tapol, produced *Banking on Disaster*, a special issue on Indonesia's Transmigration Programme. The issue contained six articles strongly critical of the programme. They revealed that while Transmigration has been rationalised as a humanitarian programme for the alleviation of overpopulation and landlessness on the central islands of Indonesia, in fact the programme is proving an expensive failure. Not only is it providing very uncertain benefits to the millions of people being resettled, many of whom find themselves in a worse economic situation in their new locations, but it is wreaking environmental havoc in the outer islands of the archipelago. Vast areas of tropical rainforest are being felled to make way for the settlers, while the areas' original inhabitants are, simultaneously, being dispossessed of their ancestral lands.

The issue also exposed how, far from being unplanned side-effects of the programme, the alienation of tribal peoples from their lands and their accelerated and forced integration into the national society are fully intended consequences. In fact, one of the main reasons that the Government has pursued its disastrous policy has been to extend its control over remote and isolated regions, which explains the Indonesian armed forces' heavy involvement in the programme. *The Ecologist* focused es-

pecially on the support provided to Transmigration by international aid agencies and commenced its special issue with an open letter to the World Bank calling for it to suspend its funding, especially in view of the fact that the programme is designed to implement Indonesian Government policies which are directly counter to the expressed policies of the Bank.

The Ecologist's special issue was launched to the press in Washington on 6 May 1986 and in London a week later. Simultaneously, the subject was raised at the US Senate by Survival International and, coincidentally, by a coalition of twenty Indonesian non-Government organisations concerned with forest conservation. Speaking before the Senate Appropriations Committee, which has responsibility for channelling funds from the US Treasury to the Multilateral Development Banks and which is currently reviewing the World Bank's environmental and social performance, Emmy Hafild, coordinator of the Network for Forest Conservation in Indonesia (SKEPHI), noted that 'Transmigration is now the most serious threat that exists for our forests and soils'.¹

The Indonesian Government's Response

The launch of the campaign received wide coverage in both the Indonesian and international press, prompting Indonesian Government spokesmen into responding to the criticisms. These responses have been curiously contradictory. In one breath the authorities angrily denied the allegations made in *The Ecologist*, whilst in another they made statements which (perhaps unintentionally) re-

vealed those allegations to be justified. Thus, in dismissing the lobbyists concerns about forest destruction, the Indonesian Minister of Transmigration, Martono, noted that it was indeed true that tropical forests were being cut down because the transmigration sites require huge tracts of land. Claiming that it was quite 'normal' to cut down trees to promote regional development, he asked rhetorically, 'Just tell me where forests are not being cut down in this day and age?'²

The Minister acknowledged too the assimilationist intent of the programme. Brushing aside Survival International's concerns for tribal peoples, the Minister stated, 'The minority ethnic groups are not the only ones that will disappear; ethnic groups like the Javanese, the Bataks, the Sundanese and so on will also disappear in the process'.³ He went on: 'The Transmigration programme highlights social integration so that racial differences and differences between ethnic groups will no longer exist. There is no such thing as one ethnic group colonising another'.⁴ According to the Minister for the Environment, hunters and gatherers have to be removed from their lands to allow for the introduction of agriculture and new farming methods. Social conflict between Javanese and local people, as he put it 'the subjects and objects of development', are thus inevitable. They can be tackled by 'slipping' the locals into Transmigration rites as local transmigrants.⁵ Social conflict between Javanese and local people, as he put it 'the subjects and objects of development', tackled by 'slipping' the locals into transmigration sites as local transmigrants.

Marcus Colchester is Projects Director of Survival International, the human rights organisation that defends the rights of threatened tribal peoples to survival, self-determination and the use and ownership of their traditional lands.

Martono also defended the exaggerated targets for resettlement which had, in large part, provoked the controversy. Questioned whether it was true, Survival International had alleged, that the Government planned to move 65 million people from Java in the next twenty years, Martono admitted the figure, remarking "in fact, we hope to move even more than 65 million, if we possibly can".⁶

The Minister has also repeatedly stated that he would invite Survival International to look at some Transmigration projects, an invitation also extended by the Minister for the Environment.⁷ To date, Survival International has received no such invitation however.

It is clear that the campaign has had a strong effect on the Indonesian Government. The foreign critics have been denounced as "politically motivated"⁸ and as "hirelings"⁹ who have made an "issue" out of Transmigration for "political reasons"¹⁰. In a major public speech, President Suharto himself claimed that the lobbyists were engaged in an international conspiracy to undermine the Government's authority. General Murdani, Commander-in-Chief of the Indonesian Armed Forces, linked the Transmigration campaign with internal criticism of the military regime and with accusations by certain Australian journalists of presidential corruption. He asserted that the lobbyists were engaged in a smear campaign designed to split the leadership of the Armed Forces and discredit the head of State.¹¹

That the criticisms have seriously upset the Government is also made clear by the fact that the Department of Transmigration signed up a US public relations firm, which has mounted a campaign to counter them. News conferences, public speeches and arrangements for foreign journalists and politicians to visit selected transmigration settlements have all been expressions of this propaganda effort.¹² Meanwhile, the local press has been encouraged to cooperate and become part of the "non-governmental implementation apparatus."¹³

The trip for politicians to visit sites in Sulawesi appears to have served the Indonesian Government's ends relatively well. Altogether 28 diplomats from 18 countries were taken to sites near the regional capital,

Kendari, where reasonable soils and well-developed infrastructures have allowed the transmigration sites to produce and market a rice surplus. Following their visit, a number of the diplomats were quoted as denying the validity of criticisms of Transmigration.¹⁴

The tour organised for foreign journalists to visit West Papua proved something of a fiasco, however. In its special issue, *The Ecologist* had pointed to the ethnic conflicts which already characterised the region. This was said to be a figment of the imagination. To the embarrassment of the Indonesian Government, the visiting journalists actually found themselves

"On behalf West Papuan Pipel, we thank you true and God blessing you and your institution."

*Letter from West Papuan Refugees to
Survival International, commenting on
The Ecologist's special issue*

in a Transmigration site only minutes after it had suffered an armed attack by West Papuan nationalists, who have been fighting an underground war against Indonesian rule ever since 1966.¹⁵ The resulting press coverage was not as complimentary as the Indonesian government might have wished.¹⁶

One of the strongest cards played by the Indonesian Government is to invoke the support provided by the foreign agencies as evidence that the programme is a reasonable humanitarian venture. "Were it true that transmigration destroys minority tribes and tropical forests", claimed Minister Martono, "countries like the USA, West Germany and the Netherlands would not support it."¹⁷ In the same way, the Indonesian Government has dismissed criticism of Transmigration voiced at the United Nations.¹⁸

As the Indonesian economy began to come under strain with the fall in world prices of crude oil, the Indonesian Government was faced with the embarrassing prospect of having to announce cuts in its Transmigration programme, at the same time as describing the programme as essential on

humanitarian grounds. To shore up the Department of Transmigration's flagging energies, the Government announced that the military would be stepping up its support of the programme. General Murdani threw himself behind Transmigration, with offers of assistance in transport and the construction of infrastructures in remote areas.¹⁹ A cut of 50 per cent in the budget was rumoured from early July, but the Ministry of Transmigration was reluctant to admit that it would have to slash targets and announced that they would be met by promoting more 'spontaneous' transmigration.

In fact, reductions in the programme began to be announced in early July. The Minister stated that the emphasis in the coming months was to be on improving existing sites rather than the creation of new settlements.²⁰ According to the Minister, Transmigration efforts during the coming year would be limited to those receiving assistance from foreign Governments,²¹ suggesting that Western aid, long integral to the programme, was to become its mainstay.

The Reaction of Indonesian Conservationists

The response from the Indonesian non-Government organisations has been more mixed.²² Clearly many groups have been unable to go along with, and have even resented, the argument that Transmigration is being promoted by central Government for political reasons, even though this is readily recognised by, among others, Dutch Government analysts.²³ Some groups have gone so far as to accuse the campaigners of 'racism', presumably because of their anti-integrationist position.²⁴ This criticism also seems ironic considering that such disparate organisations as the World Bank, the United Nations and the International Labour Organisation have all rejected policies aimed at the accelerated integration of tribal peoples.²⁵

Yet some of the non-Government organisations have admitted to the validity of many of the criticisms and have urged that they be taken into account. "Excesses must be prevented, particularly those that result in local cultures being marginalised and destroyed, for these cultures are part of the national heritage" noted Mulya

Lubis of the independent legal aid bureau, LBH.²⁶ Erna Witar, Executive Director of the Forest Conservation lobby group WALHI, expressed the opinion that the Transmigration programme frequently fails to take into account environmental and social impacts. "Indonesia would do well to understand the criticisms made by Survival International" she said.²⁷

In September 1986, seven major Indonesian environmentalist organisations, representing a much greater number of smaller groups, presented their concerns to the new President of the World Bank, Mr Conable. Pointing out that the majority of the 8 million hectares of agricultural wasteland in the outer islands are failed Transmigration sites, the groups asserted that the programme was leading to unsustainable development and ecological degradation. Unlike the foreign critics, the agencies did not mention human rights issues or make any reference to the military or political dimensions of the programme. Limiting their discussion to economic and environmental considerations, the groups called for a revised Bank policy of investment in sustainable development in new 'growth poles' on the outer islands and urged that new settlement sites be located in grasslands rather than in forest or wetland areas.²⁸

That the Indonesian NGO community should feel constrained from open discussion of human rights and political issues is perhaps unsurprising. All such organisations in Indonesia are severely limited by the repressive 'society laws' by which the Government can dissolve NGOs at whim. In 1986, *Kabar Dari Kampung*, a NGO journal which has carried well-researched articles critical of the implementation of Transmigration in West Papua, had to cease publication, apparently after it lost its publication permit.²⁹ In October, the major Jakarta daily *Sinar Harapan*, the paper with the country's second largest circulation, which had carried many articles critical of Transmigration, was closed on Government orders under the restrictive press laws.³⁰

One of the most unfortunate results of Jakarta's repressive policies is the complete absence of any independent political organisation among the tribal peoples themselves, which would enable them to articulate their own



'Transmigration to Disaster'. Marcus Colchester speaks to an exiled West Papuan at the June demonstration outside the 1986 IGGI meeting.

opinions about the programme. Only in West Papua has any alternative voice been generated. There, the Free Papua Movement has consistently criticised Transmigration, a line echoed in a recent letter to Survival International from Papuans in refugee camps in Papua New Guinea, who wrote, after reading *The Ecologist*, "on behalf West Papuan Pipel, we thank you true and God blessing you and your institution".

The World Bank's Reaction

Mr Clausen, the outgoing president of the World Bank, responded to the letter published in *The Ecologist* by circulating a lengthy reply, which was also officially released to the press in Jakarta. Claiming that "no large-scale resettlement effort in modern times has been carried out with so little communal tension", the Bank asserted that two-thirds of a representative sample of migrants said their incomes had improved following resettlement. The Bank also played down the role of Transmigration in tropical deforestation and in the destruction of native cultures. It declined to comment on either the contradiction between its own development "guidelines" and the policies of the Indonesian Government, or on the national security implications of the programme. While attempting to sweep the NGO's substantive concerns under the carpet, Mr Clausen admitted that the programme had not been without problems, but argued

that "economic and social development entails trade-offs" and "difficult choices".³¹

Mr Clausen's failure to address the NGO's criticisms head on was brought to the attention of the Bank's incoming President, Barber Conable, in a further letter which drew a reply from the Bank three months later.³² Refuting the statistics on forest loss cited in *The Ecologist*, which were derived from a survey carried out by three Indonesian Ministries and the London-based International Institute of Environment and Development, the Bank asserted that only 3 per cent of Indonesia's forests were liable to be lost to Transmigration by the year 2000, less than a fifth of *The Ecologist's* figure. The trouble with the Bank's lower estimate is that it only includes the direct forest loss attributable to site clearance and ignores the much larger areas of forest that are in fact cleared when economically successful sites spill over into surrounding areas, or when migrants from failed sites move into the surrounding forest as shifting cultivators.

Mr Conable also made the extraordinary claim that the Bank knew of only one Transmigration site containing retired army personnel and made no further comment on security issues other than to insist that the Bank "has not assisted in the establishment of settlements for military reasons". The Bank has clearly fought shy of addressing this question, for the resettlement of retired (and active) military

personnel in Transmigration sites continues to be reported in the Indonesian press.³³

In December 1986, a further 46 families drawn from two different army divisions were reported to have been despatched to a Transmigration plantation estate in Riau.³⁴ Major General Harsudiyono Hartas, commander of the Central Java Diponegoro Division, bade them farewell with the exhortation:

"A soldier will always be challenged to keep his resettlement area as an effective fortress. Not only for the sake of development but also to protect it against all kinds of threats, challenges, hinderances and disturbances that can create disorder for the safety of the people and nation. Besides that, the dissemination of the population by means of Transmigration is the best method to step up national unity and national vigilance."³⁵

Mr Conable's letter even went so far as to contradict statements made by senior Indonesian army officers, who have made plain the strategic importance of Transmigration settlement in border areas, by claiming that "the criteria used for site selection and evaluation are technical and economic."³³

The Bank also redeployed the argument that its involvement in the programme has helped mitigate its social and environmental costs by improving the criteria for site selection. Far from confronting the NGO's concerns regarding the programme's impact on tribal peoples, the letter merely restated, almost word for word, the Bank policies towards Transmigration as originally outlined in *The Ecologist*.³⁶

Yet the Bank has been more attentive to the criticisms made in *The Ecologist* than these public statements may suggest. Internal communications between the Transmigration Settlement Planning Advisory Group (TAG) and the Bank, reveal that they made a careful reading of the magazine. One memo, dated 2 June 1986, stated that *The Ecologist's* publication is part of the...

"presently fashionable activity of international bodies to criticise the internal policies of several of the World's Governments, and is bound to have far-reaching repercussions. These bodies often serve to coordinate and direct the often intangible anxieties felt by the population at large concerning issues of environmental damage on a global scale, and they often foster

an approach based more on emotions than on realities."

The Planning Group, in particular, disagreed with the suggestion made in *The Ecologist* that Transmigration is the main cause of environmental degradation in Indonesia. Contrary to the arguments presented in *The Ecologist*, and echoing the claims of Indonesian Government officials,³⁷ the analysis suggested that the main agent of forest destruction in Sumatra, Sulawesi and Kalimantan is shifting cultivation which, TAG asserted, is practised not by migrants but by indigenous farmers. The analysis went on to refute other statements made in *The Ecologist*, concerning: The negative impact of the smallholder nucleus estates (tree-crop plantations); the degree to which Transmigration was directly responsible for the flight of refugees from West Papua; and the extent to which military considerations have determined site selection. However, it conspicuously avoided addressing the most developed argument in *The Ecologist*; namely, that Transmigration is being promoted by the Indonesian Government as a means of applying its policies of "territorial management" and the accelerated integration of tribal peoples into conformity with the national majority.³⁸

In summing up its critique of *The Ecologist*, TAG did, however, note a number of problems with the Transmigration programme with regard to the establishment of viable settlement sites, most of which it suggested could be overcome by providing the migrants with more fertilisers, lime, access to markets, second stage tree crop development and extended credit. Placing the negative impacts of Transmigration in the future, the analysis also noted:

"Failure to recognise these deficiencies and take appropriate action may result in many of the accusations in *The Ecologist* being justified... settlement based on unsustainable food production must cease. Where settlements exceed the ecological carrying capacity under the standard model and inputs, settlers will be forced to:

- i) seek off-farm employment where available, often reducing employment opportunities for the local population; or where not available.
- ii) return to place of origin, or
- iii) register for resettlement, or
- iv) migrate to local towns, which

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usually have no economic base to accept them, or

- v) compete with the local population in harvesting natural resources until these become non-renewable (extinction), or
- vi) become uncontrolled shifting cultivators, which could lead to extinction of forest resources and severe environmental degradation in a very short space of time."³⁹

In sum, the main disagreement between *The Ecologist* and the Bank appears to be the extent to which the problems inherent in Transmigration have already become serious. Moreover, while the Bank believes that its involvement in Transmigration has helped to improve the programme, the critics believe this to be wholly inadequate and have continued to urge the suspension of aid until the Indonesian Government first undertakes major policy changes.

Protests Continue

Since May 1986, the campaign to halt international funding of Transmigration has been pursued through a number of channels. Copies of *The Ecologist* were sent with a covering letter to all the Executive Directors at the World Bank (none of whom deigned to answer), while others were mailed to senior officials of all the national and international agencies funding the programme (eliciting a variety of replies). By the summer, it had become clear that the economic crisis in Indonesia brought on by the fall in oil prices meant, at the least, a substantial cut in the Transmigration Department's budget and the targets for resettlement. In their July letter to Mr Conable, the NGOs urged that "the Bank takes this opportunity to reconsider its involvement in the Transmigration programme."³²

Attention was focused on the international community's funding of Transmigration by the 29th meeting of the Inter-Governmental Group on Indonesia, which met in The Hague in early June 1986. Preceding the meeting a number of NGOs assembled to discuss the issue of foreign aid to Indonesia, a meeting which led to the forwarding of a petition to the Dutch Minister of Development Assistance, Mrs Schoo, who as chairman of the IGGI was urged to insist on reforms to the programme.⁴⁰

Press conferences and demonstrations at the time of the IGGI meeting against foreign funding of Transmigration also led to further attention being focused by the media on the issue.⁴¹ Amongst those who urged that the IGGI meeting address the question of international support for Transmigration was the Chairman of the Foreign Operations Committee of the US Senate's Appropriations Committee.⁴²

At the same time, the Australian Council for Overseas Aid, which has published its own critique of Transmigration, called for a halt to the programme until its damaging side-effects are eliminated. The council urged the Australian Government to request the "suspension of the program at the World Bank . . . until the social, economic and environmental impact of the program has been reviewed and reported on publicly."⁴³

In October 1986, the Washington-based Environmental Defense Fund coordinated the sending of a further joint letter to the World Bank "in the name of more than 10 million citizens from 14 countries represented by the 51 signatory groups". Claiming that the programme "will result in the tragic and needless destruction of two of Indonesia's most important resources, its tropical forests and wetlands . . . and risks grave infringements on the rights and customary lands of indigenous peoples . . . of Kalimantan and Irian Jaya", the letter went on to reiterate some of the arguments presented in *The Ecologist* as well as adding others.

In particular, the letter focused attention on the economic unviability of Transmigration settlements. Citing the Bank's own reviews, it noted that 90 per cent of settlements established in the third five-year plan had an economic rate of return that was either negative or less than 1 per cent—and that the average income of migrants is lower than the average income in Java. The letter asserted that in 1985, a higher proportion of people in transmigrant settlements (20 per cent) were living at or below subsistence level than in Java (15 per cent).

While urging the World Bank and the Indonesian Government "to reconsider the nature of their support for the programme", the letter went

on to spell out changes it felt were necessary if the programme was "to have any chance of avoiding environmental and social disaster". These measures included the reduction of targets, the rehabilitation of failed sites, an emphasis on site selection in grasslands, the development of new farm models, a suspension of support for the smallholder nucleus estates programme, the improvement of extension services, and the protection of the rights and lands of indigenous peoples and of conservation zones. Other measures were also proposed to improve the overall development process, including an independent review of the impact of Transmigration on tribal peoples and the implementation of land reform.⁴⁴

Subsequently, the public pressure on the World Bank to curtail its involvement in Transmigration has intensified. At the end of September, NGOs around the world staged a number of demonstrations calling for major reforms in the World Bank's policies as well as demanding a withdrawal of Bank funding from five 'fatal' projects, including Transmigration.⁴⁵

In December, the International Work Group for Indigenous Affairs (IWGIA) brought out another report critical of Transmigration. Based on an extensive review of Indonesian press reports and other published information, the document further substantiated the criticisms contained in *The Ecologist*.⁴⁶ The report was formally presented to the Dutch Parliament at a hearing of the inter-party committee on development assistance, where representatives from Survival International, IWGIA, and the Dutch NGO Komite Indonesia, as well as exiled West Papuans, expressed their concerns about the programme.

Recent Developments

The sustained lobbying has not been without effect.⁴⁷ A report of the US Senate's Appropriations Committee of August 1986, noted that it continued to be:

"especially concerned about the impact of large-scale . . . agricultural resettlement schemes in tropical forest regions inhabited by indigenous peoples. Neither borrower nor donor nations can afford to invest large amounts on failure-prone colonization projects in trop-

ical forest areas with generally poor soils.

It would seem ill-advised to continue funding such projects, if those projects are going to result in massive deforestation and public health problems. The Committee would call to the attention of the Treasury Department that environmental, socio-cultural and economic risks associated with resettlement projects continue, as evidenced by testimony of environmental groups concerning the Indonesian Transmigration Program.⁴⁸

The Bank's reluctance to heed these and previous warnings had profound consequences. In September, the US Senate announced major cuts in its lending to the World Bank for 1987. The Chairman of the Appropriations Committee, which allocates US Treasury funding to the World Bank and other multilateral development banks (MDBs), reported:

"The multilateral development banks have failed to meet the fundamental environmental concerns of this Committee regarding resource management, conservation and protection of indigenous people. One of the reasons the Committee has reduced funding for the MDBs is due to the banks' failure to address the specific criticisms this Committee has made . . . The Committee is deeply concerned that despite urging by the Committee and the administration, the multilateral development banks have not adequately considered, nor acted, to prevent unacceptable environmental consequences of a large number of projects currently being funded or selected for funding."⁴⁹

Meanwhile the Transmigration programme in Indonesia itself has run into severe financial difficulties. A 45 per cent devaluation of the Indonesian *rupiah*, announced in September, gives some measure of the country's financial difficulties. In December, the Minister of Transmigration announced a 54 per cent cut in the programme's budget due to the fall in oil revenues, a figure President Suharto hiked to 65 per cent when he announced the budget for the coming financial year in January.⁵⁰ The figure compares to an overall cut in development spending of only 6.5 per cent. Moreover, the size of the cuts in the resettlement itself seem disproportionate and surprised even the Minister of Transmigration himself.⁵¹

According to the Indonesian press, the Government has made these cuts

partly in response to the pressure that it has come under from the World Bank, which, a report notes, has been particularly concerned at the cost of the programme, as well as by its failure to meet its targets. The report also notes that the World Bank has expressed criticism of the environmental consequences of the programme.⁵² Sources within the Bank have hinted to Survival International that the concern raised by its campaign has been partly responsible for the scale of the cuts.

More Action Needed

The Indonesian Government and the funding agencies have clearly been stung by the criticisms of the Transmigration programme, not all of which they have been prepared or able to shrug off. It also seems clear that the internal and international criticism has been partly responsible for the unexpected scale of the recent cuts announced to the programme. Some analysts project that it is unlikely that the Government will be able to step up the Transmigration effort again for at least two years.

The massive scaling down of Transmigration now offers the funding agencies a unique opportunity to re-evaluate their involvement in the programme and withdraw from it without unduly upsetting the political sensitivities of the Indonesian Government. Whether they do so or not depends, to a large extent, on whether the lobbying organisations sustain their campaign.

Although it seems evident that the funding agencies and, to an extent, even the Indonesian Government, are heeding some of the criticisms of the programme, it is clear that they do not accept all of them. The fact that the World Bank has criticised the Indonesian Government for *not* achieving its targets, when it is these targets which are largely responsible for the programme's excesses, is one worrying example.

There are other worrying signs too. In the last months before the financial cuts were announced, the Government made a series of statements which suggested that Transmigration might be continued under new guises. There was talk of stepping up the quotas of 'spontaneous' transmigrants (who pay their own way

though within the framework of the programme itself),⁵³ and of increasing the involvement of private companies,⁵⁴ especially by offering incentives to lure more of them into the small-holder nuclear estates programme.⁵⁵ The fact that the new year's budget shows a 40 per cent increase in the allocation to 'housing-settlement' (*perumahan rakyat-pemukiman*) also raises the question of whether this is to be Transmigration by another name.⁵⁶

Survival International and Tapol are, therefore, reiterating their call for a suspension of international assistance to the programme until there are guarantees that it will not lead to the destruction of the environment, the alienation of tribal peoples from their traditional lands and the abuse of their right to self-determination.

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16. *The Economist*, 'Cover up job' 15 November 1986; *The Guardian*, 'Mixed blessings in transmigration of souls' 12 December 1986; 'Indonesians unsettled' 2 January 1986; 'Snarl of discontent in Irian Jaya' 5 January 1986.
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 29. *Tapol Bulletin* No. 78, December 1986, p. 20.
 30. *Tapol Bulletin* No. 78, December 1986, p. 27.
 31. Letter from Mr A.W. Clausen to Survival International, 11 June 1986.
 32. Letter from Survival International, Tapol, Friends of the Earth and *The Ecologist* to Mr Barber Conable, 15 July 1986.
 33. Letter from Mr Barber Conable to Survival International, 27 October 1986.
 34. *Pikiran Rakyat* 19 December 1986; *Suara Merdeka* 22 December 1986.
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 36. *The Ecologist* Vol. 16, No. 2/3, p. 65.
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39. Draft memorandum from William Sim of the Transmigration Settlement Planning Advisory Group to Ir. Widarbo Dharmosusilo 30 May 1986. The draft carries the handwritten note that it "was not sent, as it expresses both facts and opinions. The opinions were deleted, but will be held for discussion with the client and will be incorporated into our final report".
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41. *Tapol Bulletin* No. 76, July 1986, p. 19.
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43. Letter from ACFOA to P. Keating, Treasurer Parliament House, 28 May 1986; ACFOA briefing document *Transmigration in Indonesia* May 1985; ACFOA briefing document *Transmigration in Indonesia: update*, July 1986.
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Transmigration: Letters Received

Dear Sir

We the NGOs of Indonesia are writing in response to several articles in *The Ecologist* Vol. 16 No. 2/3, 1986. We do appreciate the international concern for the degradation of Indonesia's environment and cultural existence of the tribal peoples. However, we would like to clarify certain points, as given below.

The "famous" transmigration programme is in fact more of an ecological and natural resources mismanagement issue than a colonization, political or military issue. If wisely and appropriately implemented we believe this programme does not necessarily represent the grave threat to either the environment or indigenous peoples that was presented by *The Ecologist*. We also feel strongly that your articles put too great an emphasis on the impacts of the transmigration programme on the environment and tribal peoples of Irian Jaya, while in reality greater threats to the environment and sustainability of natural resources exist on other transmigration sites such as Kalimantan and Sumatra.

Transmigration settlements are usually established in or near rainforests. We believe this is one of the reasons why the transmigration programme presents one of the greatest potential threats to the ecological balance, through inappropriate choice of site and unwise management. We in Indonesia feel that it would have been more appropriate to put

emphasis on these problems, than on the political aspect, which we feel is less important.

Transmigration is made possible, in part, by the US\$600 million loan from the World Bank. A large part of this loan is spent on surveys and land

foreign consultants. Thus, ironically, a large portion of the money originally intended to aid (developing) countries such as Indonesia ends up in the pockets of foreign nationals from the donor countries, very often in the form of honorariums or equipment prices. Therefore, it seems somewhat senseless to us for a country such as Indonesia to obtain a large loan only to have the greater part go back to the source of the loan. Such being the case, we feel compelled to ask the question, "Do loans such as the aforementioned one from the World Bank really help the economic development in Indonesia?"

Even in the cases where some portion of the loan money does trickle through to Indonesians themselves, those who benefit most are generally business enterprises who conduct land clearing and implementation. The transmigration programme, then, becomes big business both for the business community in Indonesia and the foreign nationals from countries such as The United States.

Now to consider the human element. More than transmigrants, it is the foreign and domestic businessmen looking for new opportunities to make a profit who negatively affect the local cultures. With total lack of appreciation and sensitivity, they manipulate the innocent tribal peoples, who are often not aware of the ways of the modern world, for their own gains. One example is the large illegal trade in Irian Jaya's crocodile



clearing done with imported bulldozers. In addition, it is said that at least 17 per cent of this money goes in bribes. We believe this money could be better utilized. The surveys are most often conducted by using sophisticated satellite laser beams, with

skins. In the past, intensive commercial hunting was seldom done. But now commercial minded visitors organise the hunt with better facilities. They supply the indigenous peoples with modern hunting apparatus in return for crocodile skin. The price of crocodile skin is high and hence often exported, but the return to the indigenous hunters is very meagre. Owing to their innocence, then, these indigenous peoples become easy prey to the manipulating visitors.

Inherent in the process of transmigration is often a cultural gap created between the new settlers who are more developed and the indigenous people who are less developed. It is necessary to bridge this gap without threatening the culture and traditional wisdom of the indigenous people. We cannot let our indigenous brothers be left innocent and unaware of the modern developments. For, as long as they remain where they are, they will be exploited by profit hungry people. We believe there are ways to bring development to them while sustaining their culture. One positive ramification of the transmigration programme is the indigenous people's rising awareness of the importance of school. When they see their transmigrant brothers gain education from school, they often become more willing to go to school. In this way they can begin to develop intellectually in

the same way as other Indonesians.

Another problem stems up from the different patterns of cropping. Transmigrants practise the same pattern of agriculture in areas whose soil fertility and structure differs from those in Java, Bali and Lombok. Naturally this is not suitable and contributes to the failure of the programme. Often neither the local peoples nor transmigrants are adequately prepared for the changes that the programme works on their lives. The local peoples are not used to annual food cropping and the transmigrants found that soil fertility and sustainability for annual food cropping lasts for only 2 or 3 years. Once the soil becomes barren, the settlers resort to slash and burn farming, which in most cases becomes the primary cause of the conflicts with the indigenous peoples. The tribal peoples generally feel that these new settlers encroach upon their land. So the process can be seen as a competition between humans for livelihood rather than anything else.

The transmigration programme can be a success if implemented well. This is demonstrated by the achievement of spontaneous transmigrants who settle down independently of facilities provided by the government. For example, ex-Tapol settlers in Balikpapan have successfully managed their lands since 1977. They opened up lands themselves manually, thus converting top soil. They plant a wild

variety of paddy which is suitable for the area and also integrate this with animal stock. They are aware of appropriate patterns of cropping along with simple resources such as manure, etc. This is in contrast with the sites of Transmigrasi Umum, where good harvest is generally obtained with high inorganic input only for the first 2-3 years. After 5 years, the land produce usually decreases because the soil fertility is reduced and not suitable for annual food cropping by which time government facilities and aid are no longer provided.

Weighing the pros and cons, we do consider that transmigration is ecologically destructive as long as it is located in forest areas and not well planned. But so far, this is the programme considered one of the solutions for population problems in Java. Several attempts to seek alternatives to replace this programme have been thought of. However the situation is complex and cannot be overcome just by stopping the whole programme. Therefore, we consider it unwise to halt this programme outright and instead we feel that serious improvements should be implemented. The improvements measures and alternatives that we recommend are as follows:

1. The management and planning of the entire transmigration programme is not implemented well. It needs an intensive, proper plan-

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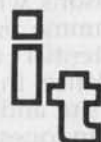
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ning and implementation (including infra-structure) conducted by dedicated people to make a success of this programme. One alternative is to involve NGOs, concerned private individuals, etc. We also advocate that reports of the consultants, which at present are not disclosed, be publicly discussed in order that NGOs, public and government officials can help put forward recommendations together. In this way, we can all share responsibility seeing that the programme is implemented wisely.

2. We recommend that the target number of transmigrant families be reduced drastically. We believe that with the present amount of funds and fewer families, a higher quality of settlements can be established. At present the amount of funds for the welfare of the transmigrants is less than the amount allocated for surveys, consultants, etc.
3. It might be better if money borrowed from various sources be spent on improving infra-structure rather than on sophisticated methods of survey such as laser beam contour mapping. For even with this sophisticated survey methodology, field/ground survey must also be conducted.

Instead of wasting money on air why not use it appropriately on land? This will mean an added advantage of involving more Indonesian field surveyors, and the extra budget can be used for transferring knowledge and expertise in Indonesia.

With a smaller number of people settled, more funds can be devoted to their welfare and also to overall improvements of their physical surrounding (including infra-structure). Regional integrated development is another aspect to be considered. We suggest that the transmigration programme include regional decision makers.

We feel that the above suggestions should be supported by the government and the donors such as World Bank. Meanwhile any other alternative and improvement other than those mentioned above should also be studied, like the idea of appropriate industrial transmigration, culture of forest, plant and animals, etc.

4. Primary forests should not be considered for transmigration and PIR (nucleus estate) programmes. If there is no other choice except primary forest areas, then social forestry is recommended. This involves the utilization of renewable forest resources such as rattan, seeds, fruits, and firewood. This could give people an opportunity to be involved in sustainable forest management for their own benefit.

Instead of primary forests, de-

graded forests and along-alang grasslands which are rehabilitated first should be used for the transmigration programme. Rehabilitation of critical lands should be a priority and an integral part of transmigration sites where possible.

MDBs should also include grants to settle land disputes. The critical lands that are claimed by several people can be compensated for with the help of the above grants. These lands should be rehabilitated and then utilized for transmigration sites instead of being left wasted and unproductive. This can save further degradation of primary forests.

5. Patterns of agriculture other than rice growing should be developed, especially through learning wise land management from traditional forest dwellers. A better physical and cultural balance between local people and transmigrants should be maintained, perhaps even with a ratio of 50:50. We believe this will reduce conflicts and also establish a better atmosphere, especially if a good exchange of traditional wisdom can be encouraged between the two groups.
6. Finally, a comment for the World Bank and other MDBs. In attempting to overcome problems of environmental degradation such as the vast critical lands that we have, and in attempting better socio-economic development, the World Bank should not consider Indonesia as a "market" but as a grant recipient. They should also acknowledge the existence of NGOs in Indonesia by encouraging their input and involvement in decision making processes.
7. Again, we are grateful for the concern and goodwill extended to Indonesia by our international NGO friends and for the opportunity to express our differences of opinion regarding several aspects of the Transmigration programme.

Thank you very much for your attention.

Yours sincerely,

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Mexico's Green Movement

Most experts agree that Mexico's environmental problems have reached critical proportions. However, there are some signs of an awakening public consciousness.

Driving, bumper to bumper, through the smog of Mexico City is an experience that millions have to suffer. It is a daily reminder of the environmental chaos to which the city has succumbed. Recently, however, a new car "sticker" has appeared which, for the first time, signals an attempt to change this state of affairs. Unlike most Mexican car stickers, it does not invoke national unity in the cause of the P.R.I., Mexico's ruling party, nor does it sing the praises of the last beach resort which the motorist visited . . . Acapulco, Cancun, Ixtapa. The slogan simply reads: "M.E.M. es Primavera" (M.E.M. is Spring). It means that the Mexican Ecology Movement has arrived at last. To understand fully the significance of this late addition to the Green Movement, we need to consider the current condition of Mexico's environment and the response of the Mexican state to the impending crisis.

Mexico's Ecological Crisis

Mexico City is one of the most polluted urban environments anywhere in the world. Air contamination is so bad that there are parts of the city where it is literally painful to open your eyes. The exhaust fumes from two million cars, buses and lorries mix with the untreated industrial fumes from the city's many industries. In addition, the airborne residues of human excrement deposited on Lake Texcoco are periodically blown across the sky. Solid waste disposal is an almost impossible task and dumps emit dangerous quantities of highly inflammable methane gas. Water supplies

have to be lifted and transported hundreds of miles to millions of homes, factories and gardens. Environmental health problems are severe, especially those related to food contamination. The city, which supported a population of 300,000 people on the basis of agriculture alone when the Spaniards discovered it at the beginning of the sixteenth century, now consumes a third of the nation's food. It is less self-sufficient now than four centuries ago. Transportation and housing problems are very considerable and the population of eighteen million grows by thousands daily.

The rural areas of Mexico are afflicted by equally severe environmental problems. The tropical forest areas are being depleted at an alarming rate. In Chiapas the forests are literally being "mined" and extensive cattle-rearing established on the land that is cleared. In the tropical areas around the Gulf Coast in the south-east, where petroleum is being extracted, the delicate ecology of the region has been devastated by the combined effects of deforestation, commercial agriculture dependent on "advanced" technology, and the *mancha urbana* (urban stain) which has degraded the quality of life for the marginal

populations "settled" in towns like Coatzacoalcas and Minatitlan. The tropical "Lacandona" forest, once one of the richest ecosystems in the New World, will not exist by the year 2010, if present trends continue.

The situation is no better in the centre and north of the country. Here "desertification" is becoming a reality, as forests are destroyed in Durango and Chihuahua, soils are eroded and even greater pressure put on the carrying capacity of semi-arid regions. Where commercial agriculture is most developed, in the north-west, irrigation systems are costly to maintain and the ecological costs of heavy dependence on pesticides and chemical inputs are considerable. In Mexico as a whole, it has been calculated that 225,000 hectares of land are lost each year as desertification spreads. On the positive side, it should be emphasised that Mexico has taken a lead in establishing "Biosphere Reserves" in four states, under the direction of Dr Gonzalo Haffter, the new head of UNESCO's "Man and the Biosphere" programme. They represent a notable exception to the general picture of neglect.

Mexico also suffers from the environmental problems associated with industrialisation, par-



Women gathering firewood in the Sierra de Puebla, Mexico. Despite the pressing environmental problems of rural areas, Mexico's environmental movement has yet to reach the country's peasants.

Photo: Michael Redcliff

ticularly in the Federal District and border towns like Ciudad Juarez. The recent "Cobalt 60" scandal in San Juan de Tula was only one of many cases in which industrial wastes have been dumped without proper precautions being taken. At least twenty per cent of Mexico's chemical and radio-active waste is dumped illegally. Lakes and rivers are contaminated by industrial pollution; coastal areas are degraded by both industrial and residential sewage disposal.

The formal acknowledgement of Mexico's serious environmental problems came with the establishment of a new Department of Urban Development and Ecology by Mexico's incoming President, De la Madrid, on December 2, 1982. Both in his election campaign and subsequently, De la Madrid has drawn attention to the need for radical action on the environment. Unfortunately, little has been done in practice and, faced by a continuing economic crisis and external debt, few resources have been channelled to the new Department. In addition, as its contribution to the recent "Metropolis 84" conference in Paris made clear, the Mexican Government regards environmental issues as a lower priority than "satisfying the country's necessities: food and water". Only long-term planning will save the environment, and long-term planning is neither politically nor economically attractive to governments at a time of national insolvency.

The Mexican Ecological Movement

The conservation movement has been slow to develop in Mexico. Most of the twenty or so conservation groups that exist operate at a local level with very small memberships. The exception is the "Mexican Ecological Movement" (M.E.M.) founded in 1982 by Alfonso Cipres Villarreal, who for the last fifteen years has been an indefatigable and often isolated critic of environmental neglect. Today, the M.E.M. has fifty-two thousand members organised around local groups of "clubs". Membership is drawn almost entirely from the middle classes, who are also seen as the most fertile ground for the movement's future growth. The millions of *campesinos* or peasants



Photo: Michael Redcliff

Fire-eater dodging traffic in Mexico City. The exhaust fumes from 2 million cars, lorries and buses make it painful to open one's eyes in some parts of the city.

who make up the bulk of Mexico's rural population, and the industrial working class, are not considered "ripe" for conversion to environmentalism.

Its narrow membership notwithstanding, the M.E.M. has proved surprisingly effective as a pressure group. The organisation sees itself as a necessary corrective to the often sanguine public pronouncements of the Mexican Government. It has resisted attempts by the P.R.I. to provide funds in return for political control and it has constantly rejected the offer of funds from corporate industry, including Union Carbide. The M.E.M. is highly critical of Mexican Government policy while emphasising its allegiance to the Constitution, and the concept of "Revolutionary Nationalism" in Mexico. On the several occasions in which its leaders have been received by the President (the last in November 1984) the M.E.M. has been at pains to distinguish between its anti-Government stance and its unwillingness to act as a party of opposition. Cipres Villarreal argues, perhaps disingenuously, that the M.E.M. will only become a political party when it has two million members.

The principal method adopted by the M.E.M. is to win the vocal support of prominent Mexicans in both the arts and the sciences. Although public demonstrations have been held, some of them large, direct action is con-

demned. Moreover, there have been some notable successes in seeking out members from within the technical and cultural elite. Writers, like Octavio Paz, Juan Rulfo and Jose Luis Cuevas have all joined the movement and given it public support, as have artists like Tamayo and Ignacio Beteta. Scientists, such as the Nobel Peace Prize winner, Norman Borlaug, are also active members of the Movement.

In the view of the M.E.M. the Mexican state seeks to assume responsibility for resolving ecological problems because it is afraid to put its faith in civil society. Had the Mexican Government of De la Madrid genuinely sought to adopt radical proposals, it would have established an autonomous Institute to act as its watchdog, instead of another bureaucratic organisation to dispense favours and maintain social control. The M.E.M. sees the new Environment Ministry as a device by which the P.R.I. (Institutional Revolutionary Party) seeks to pre-empt, and ultimately control, environmental organisations within civil society. This is the Mexican "way", but not the correct way, to proceed.

A Radical Philosophy

The M.E.M.'s ideology is more radical than might be supposed from its membership. There appears to be a genuine interest in appropriate technology, alternative health care and housing policies. The determination exists to raise questions about the Mexican state's public pronouncements and activities "so that the people do not lose sovereignty over ecological issues". As their literature puts it, "the only democratic right that the Mexican people possess is the right to pollution". Several attempts have been made to infiltrate the M.E.M., notably by the Roman Catholic Church, which in Mexico lacks a social and political base compatible with its widespread but "unofficial" following. Unlike the situation in some West European countries, the Roman Catholic Church in Mexico is not looked upon as "progressive" by activists in the environmental movement. The major right-wing party, the P.A.N. (Partido Autonoma Nacionalista) is uninterested in the environment as an issue because its finances are derived

from big business. The orthodox Left parties have never taken environmental issues seriously. They are divided and poorly organised.

Talking to M.E.M. members, I was struck by the absence of a clear social programme to which environmental issues could be linked. Unlike the European Green Movement, the influence of feminism and pacifism is not great, although the movement does pride itself on its "utopianism" and is seriously worried by the risk that as it grows in size it will become more bureaucratic. Interestingly, the movement's ideology emphasises what it terms a *vision indigena* (or indigenous vision) which it argues has been replaced historically by the *vision colonial* (colonial vision) in which Mexicans have been brought up. Unlike the conservation and environmental movements in Europe and North America, radical action on the environment should take as its point of departure the need to break the knot of economic and cultural dependency which ties the south to the developed countries.

There are other indications of increased environmental consciousness. Several books published in Mexico recently, to critical acclaim, have sought to identify an alternative development path to that of modernis-

ation. Writers and journalists like Fernando Cesarman and Enrique Gonzalez Pedreso have emphasised the finite nature of resources—hence, the "limits to growth"—and the importance of sustainable development programmes which are consistent with the day-to-day realities of life in Mexico. Studies such as those of the Centro de Ecodesarrollo have documented not simply the scale of the problem, but the scope for new solutions.

The Search for Solutions

One such solution is that advocated by the group of social scientists and policymakers headed by Gustavo Esteva. This consortium (ANADEGES or Analysis, Development and Self-Management) is a non-profit organisation which seeks to build bridges with popular organisations, especially in rural areas, through projects such as agroforestry and social forestry. In the view of ANADEGES, there are only two options open to Mexico: either to follow the path of international specialisation, in which people lose control over their own lives, or to seek a more "autonomous" and less authoritarian kind of development. In their view, "basic needs" are best defined by people themselves in the con-

text of their own culture, which requires a positive re-assessment of traditional ways of using the environment: *adobe* rather than brick houses, holistic medicine, *morada* (living space) rather than industrialised housing and transport. Support for such ideas comes from internationally known thinkers like Ivan Illich, Andre Gorz and Rudolf Bahro, but the imprint is unmistakably Mexican. ANADEGES' members are currently working with people in the urban *barrio* (shanty-town) of 'Tepito', only eight blocks from Mexico City's main square, the *Zocalo*, where for over three centuries families linked by close community ties have combined self-provisioning, including keeping animals, with traditional trades and crafts. This example—the '*patio-taller*' (patio-workshop) in which people work and live in the same, shared, communal space, around a central patio—is seen as a working model of what the alternative Mexican society can provide.

Mexico's Green Movement will not develop like that in Western Europe, since the specific conditions for its development are dissimilar in many respects. Some Mexicans argue that the enormity of the debt problem and the severity of the economic recession, which has hit the poorest through reduced food subsidies combined with increased unemployment and high inflation, actually provides better prospects for the development of an alternative, more "self-sufficient" form of development. Whether or not a more radical stand is taken on environmental issues, in the broadest sense, depends (they would claim) on first dispensing with the current growth-seeking development policies which, rather than relieving Mexico's problems, have contributed in large part to creating them.

The Mexican Ecology Movement and groups like ANADEGES approach environmental issues in very different ways. In one sense, however, they both face the same hurdle: how to foster ideas about alternatives to industrial society in a country where the major ambition of the poor (as well as many of the rich) is greater participation in industrial society itself.

Michael Redclift.

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Shallow Environmentalism

THE GAIA ATLAS OF PLANET MANAGEMENT. Ed. N. Myers, Pan Books, London, 1986. £9.95

This glossy A4-size paperback has received considerable acclaim. There is indeed much to impress—fancy graphics, coverage of a vast range of topics central to green concerns, the credentials of many of the contributors. However, upon closer examination, a great deal of the glitter turns out to be dross not gold. At a time when we need the greatest clarity in our analysis of the global 'problematique', here there is too much muddled, misleading and even contradictory thought.

There is, it must be said, a great deal of merit in this book—I don't regret buying it. Just look at the section on Evolution: Paul Ehrlich's opening statement powerfully and simply spells out the dangers and what must be done in a single column. Unfortunately his argument is somewhat at odds with a lot of what is implicit elsewhere in the book. There we find support for—or, more negatively, a passive acceptance of—policies which, if implemented, would put even more of poor old mother earth under concrete, under the plough or under impounded water. The more dominant paradigm underlying many sections of the volume is essentially a sophisticated technocratic one.

Anti-Environmentalism?

My characterisation is partly based on some of the authors listed in the credits and in the bibliography—people such as Buckminster Fuller, Alvin Toffler and Peter Russell. Not only much of the content but also the very title itself reveals what, in the final analysis, is an anti-environmentalist orientation. In many ways it parallels what has been called the 'gospel of efficiency' that dominated the con-

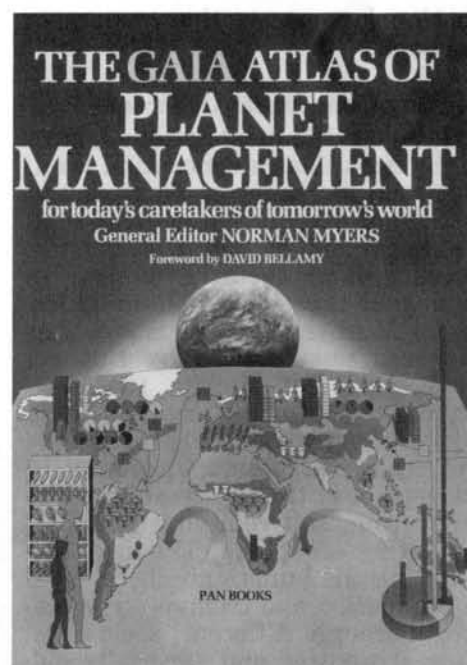
servation movement in America at the beginning of the century. It is committed to the maximum-feasible society, squeezing as much as we can out of nature, albeit in a much more sustainable and less damaging way. We would be doing much of what we do today, indeed more intensively and on a larger scale, but with a better planning and enlightened management eliminating the short-term stupidities—over-fishing, for example. Nature no longer knows best in this ideology. Indeed she can be more and more manipulated and improved upon. Ultimately nature is like any other commodity, there for the exploitation to satisfy open-ended human demands. Not surprisingly, a dominant metaphor is that of spaceship earth, one that reflects a decidedly mechanistic way of thinking. For every problem there is a fix, whether technological (eg. genetic engineering) or managerial (eg. cost/benefit analysis, environmental impact assessment, etc.).¹

I do not want to throw the baby out with the bath water. Those of us who support more radical positions nevertheless will often find ourselves marching side by side with those committed to what might be called 'shallow environmentalism'. Nevertheless at stake are different roads to different destinations.²

Apolitical

Given the issues it covers, this book is remarkably apolitical. All the ills portrayed seem to happen by themselves. No-one would appear to be promoting the ecological damage we see around us, except by way of a lack of knowledge or of foresight or of alternatives. Perish the thought that people are gaining power and money from it or stand in the way of satisfactory solutions. Names are seldom names . . . punches are pulled. Instead we have a strategy of trying to win influence amongst the powers that be in government and big business. A parallel process operates in the conference halls of environment quangos such as UNEP. In the name of 'realism', such a strategy all too often results in calls for nothing more than greater research and more information. The *Gaia Atlas* communicates a similar flavour, one that is a million miles away from the real world of, say, the Rainbow Warrior affair. Abstract generalities mobilise no-one against anything specific. Too often the book adopts a position of 'we are all to blame', one which conceals more than it reveals.

It is for such reasons that the book can discuss the arms race with scant reference to the activities of the peace movement. It condemns acid rain but not the shameful



"I have to conclude that, despite some admirable spotlighting of the perils facing humanity, *The Gaia Atlas* is a failure... It reflects a Space Age faith in human potential, expertise and technology. It is a coffee table book for the Yuppies of Silicon Valley."

record of the CEBG and British government. You would never guess that some of the biggest corporate empires are cutting down the jungles. To court the trade unions, no reference is made to the fact that many of them are the system's most loyal defenders, not least of nuclear energy. To be friends with Third World regimes, there is silence on their racist thinking and genocidal practices with respect to tribal peoples. The Atlas similarly sweeps under the carpet the active (and profitable) connivance of Third World leaders in assorted 'development' megaprojects. The biggest slap on the wrist that agribusiness receives is that it 'exerts too much influence'. The section on 'ivory tower' high-tech medicine fails to point out that some of the most powerful closed shops in the world preside over it. The real world operations of a Rupert Murdoch find no echo in the rather bland worries expressed over the communications industry. Deliberately planned obsolescence scarcely features in the section on resource conservation. The World Bank receives more praise than recent evidence in *The Ecologist* would suggest is justified. And so on.

This is a work which wishes not to give offence. It strives to be all things to all men. If you think I am being unfair (and remember that my negative remarks are mainly at certain sections and certain authors) just think how easy it would be to print selections of more radical writing alongside the more con-

ventional passages that appear in the book.³

Lacking Conceptual Coherence

However, the most serious failure of the book is at a conceptual level. There is no model of what is the essence of humanity's multi-faceted problems nor of the key driving forces behind them. I happen to think that the greatest illumination comes from the kind of model that has been put forward by Edward Goldsmith. Put simply: the over-expansion of the human-made world, the technosphere of people and their artefacts, necessarily takes place at the expense of the life-supporting, self renewing and self-regulating ecosphere. The key variables include human numbers, level of production and technology, mediated through different socio-economic structures and especially cultural paradigms (modes of perceiving, thinking about, valuing and doing things). Commentators who have used similar analytical tools have produced far the most superior understanding of what is wrong, how it is happening and how it can be corrected.⁴

This becomes much clearer when one examines the different sections of *The Gaia Atlas*. These cover such topics as land, farming, forestry, water, energy minerals, nature conservation, urbanisation, employment and living standards. Despite the fact that many dangers are well highlighted and many sound ideas proposed, the book *in toto* commits itself to increases in every variable, all barriers to be overcome by better planning, economic incentive, technological innovation or their social spin-offs (eg. development—demographic transition—population bomb defused). However, no matter how politically attractive this 'have your cake and eat it' approach might be, it all amounts to pie in the sky when set against a finite, entropy-bound and ecologically interconnected planet, where trade-offs and limiting factors proliferate.⁵

Issues Fudged

What of the specific issues? Population merits 6 out of 272 pages. That the world can scarcely support existing, let alone projected, human numbers is a thought not discussed. The problem is wished away on the assumption that social and economic 'progress' will solve it. Nowhere is the crucial concept of carrying capacity or its implications for policy debated. Nowhere are ideologies and institutions committed to population increase openly criticised. Some countries are indeed praised for stabilising their populations. But there is no recognition that this has been only for a short

period and that present levels can only be maintained temporarily by using very destructive methods of agriculture (well portrayed elsewhere in the book—a typical example of the lack of an integrated analysis), by exploiting 'ghost' acreages (other people's land) and by drawing down on the resources of future generations.⁶ There is no discussion of the explosive questions of aid and immigration policy, raised by Hardin and others.⁷ On the problem of world starvation and poverty, the *Atlas* does not go beyond the rhetoric of aid charities and development agencies.⁸

The discussion of resources and pollution exhibits an almost religious faith in the price mechanism and technology (eg. for greater efficiency and substitution).⁹ Often there is an indiscriminate portrayal of possible alternatives in the manner of the BBC's *Tomorrow's World*.¹⁰ No clear criteria to judge what is appropriate are laid out, either with respect to the ultimate means of life (the basic biophysical laws of nature) or the ultimate ends (what is the 'good' life?).¹¹

At many points, especially in the small print, you will find recognition of the kind of obstacles and drawbacks I've been discussing. But these are not integrated into the general analysis. There is no direct communication of what is the basic problem—too high a level of energy and material throughput, something not fundamentally altered by a switch to more benign means (worthwhile though that is, as part of a general restructuring and reduction of the demands we place on the planet).¹²

Problems Ignored

This failing is compounded by other gaps. Absent is a rigorous discussion of the growth-based nature of modern economies, both private and state capitalist (a word that cannot be found in the index—has capitalism ceased to exist?). The dominant features of contemporary social and cultural values remain not subjected to any searching critique. There is little discussion of the factor of scale, of the excessive size of our creations, something that makes them so unamenable to democratic control, so rigid, so frustrating of the very needs it was claimed they would serve.¹³ Perhaps such omissions explain why, for example, the *Atlas* can celebrate the glories of urban culture without giving recognition that these were achieved by what were really tiny places, in comparison to today's megasprawls. The discussion of international and regional organisations draws the very opposite conclusions drawn by thinkers such

as Leopold Kohr.¹⁴ The growing 'bioregionalist' perspective finds no mention.¹⁵ The track record of conferences such as Stockholm and of non-governmental organisations receives a more glowing report than the facts merit. Rose-tinted spectacles are worn whenever 'progressive' regimes such as China are discussed—no mention is made of her commitment to more nuclear power and more superdams nor of her role in the sad history of Korea and South-East Asia. (I suppose there is some consistency here as the 'counter-insurgency' activities of the USA are likewise somewhat lost beneath general hand-wringing over planetary violence).

Faulty Perspective

All these failures are not due to problems of space or presentation. They stem from a faulty perspective. There are books that do the job much better. Aurelio Peccei, in his short tract *One Hundred Pages for the Future*, packed in far more understanding of what was wrong and far more wisdom through which to find the answers. Lee Durrell's edited volume *The State of the Ark* on environmental conservation equally outshines *The Gaia Atlas*. The leftist *State of the World Atlas* from Pluto Press covers many of the gaps I've noted. Perhaps best of all is G. Tyler Miller's *Living in the Environment* (Wadsworth), equally comprehensive but outstanding in its clarity and rigour with respect to both problems and answers.

I have to conclude that, despite some admirable spotlighting of the perils facing humanity, *The Gaia Atlas* is a failure. I would

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characterise it as a coffee table book for the yuppies of Silicon Valley, as its predominant tenor and thrust reflect much of their brand of enlightened concern combined with a Space Age religion of human potential, expertise and technology. It lacks both clarity and punch. It fails to recognise the need to create a 'steady-state' society, living well within nature's rhythms, capacities and tolerances, respecting the rights of both those not yet born and of other species, not just because they are of use but because they exist. Easier said than done but it would help if more people had used the opportunity presented by this *Atlas* to say it.

Let me conclude on a more positive note. Part of my disappointment with this book is that many of those listed as either contributors or consultants — Erik Eckholm, David Pimental, Sidney Holt and, not least, editor Norman Myers himself — have all written excellent books and articles themselves. Let me recommend you search out those instead.

Sandy Irvine

Notes and References

1. My analysis draws heavily on the work of 'deep ecology' theorists such as Bill Devall and George Sessions, many of whose ideas are brought together in *Deep Ecology: Living as if Nature Mattered* (Gibbs M. Smith/Peregrine Smith Books). See also: David Ehrenfeld, *The Arrogance of Humanism*, D.U.P.; Theodore Roszak, *Where the Wasteland Ends*, Doubleday; Jeremy Rifkin, *Declarations of a Heretic*, Routledge; Kegan Paul; Kit Pedlar, *The Quest for Gaia*, Granada; A.R. Drengson, *Shifting Paradigms: from Technocrat to Planetary Person*, Lightstar Press.
2. An interesting comparison between the different itineraries is given by Gary Coates in the chapter 'Future Images, Present Possibilities' in a volume he has edited called *Resettling America: Energy, Ecology and Community*, Brick House.
3. This is the approach utilised by G. Tyler in his outstanding work on the energy debate—*Energy and Environment* (Wadsworth). Though he himself is highly critical of nuclear power, Miller is thereby able to allow advocates such as Alvin Weinberg their say.
4. On what exactly is the problem and why it happens, see the polemic by Paul Ehrlich and John Holdren, 'One-Dimensional Ecology', *The Ecologist*, 1972, vol 2, no 2. For a sample of the kind of integration lacking in the *Gaia Atlas* (but cited in the index), see *Ecoscience: Population, Resources and Environments* Ehrlich, Ehrlich and Holdren (Freeman). Of course, having a variety of contributors can be a problem. It can also be overcome providing there is conceptual clarity and consistency. See, for example, Herman Daly (Ed) *Economics, Ecology, Ethics*—not least the essays by Daly himself.
5. Compare the content of much of *The Gaia Atlas* with the expositions of the nature of ecological scarcity and the limits to growth in: W. Ophuls, *Ecology and the Politics of Scarcity*, Freeman; W. Jackson Davis, *The Seventh Year*, Norton; Rufus E. Miles, *Awakening From the American Dream*, Marion Boyars.
6. See: W.R. Catton, *Overshoot: The Ecological Basis of Revolutionary Change*, University of Illinois Press; J. Holdren and P. Ehrlich, 'The Human Population and the Global Environment', *American Scientist*, May-June 1974, vol 62 p.282-292. On the admittedly difficult concept of carrying capacity, see, for example E.P. Odum 'Optimum Population and Environment: A Georgian Microcosm', *Current History*, June 1970, p.355-359; R.L. Wisniewski, 'Carrying Capacity: Understanding our Biological Limitations', *Humboldt Journal of Social Relations*, Spring/Summer, 1980, 7:2, p.55-70).
7. G. Hardin, 'Population and Immigration', *The Ecologist*, Vol 7, no 7, p.268-272; G. Hardin, *Stalking The Wild Taboo*, Kaufman; G. Hardin, *Exploring New Ethics for Survival*, Viking; J.H. Tanton, 'International Migration as an Obstacle to Achieving World Stability', *The Ecologist*, July 1976, vol 6, no 6, p.221-227; G. Hardin, 'An Ecological View of the Human Predicament', *Alternatives*, 1982, VII, 2, p.242-262.
8. Population Concern have published a pamphlet *Population Misconceptions* by Eric McGraw which most effectively demonstrates that such rhetoric is founded upon a catechism of fallacies which McGraw demolishes one by one. I can testify as a teacher who has often invited Oxfam speakers into the classroom that they go out of their way to deny any population dimension to the problem of starvation. They are particularly abusive of the likes of Spike Milligan who have publically (and perhaps not quite tactfully) suggested the opposite.
9. A much more sober (and better documented) review of resource availability can be found in F.E. Trainer's *Abandon Affluence* (Zed), which also demonstrates that world 'development' as conventionally conceived is an impossibility. Trainer provides an analysis of market forces, at best touched upon in the most roundabout manner in *The Gaia Atlas*. The intrinsic weakness of technological fixes for social and environmental problems is most carefully outlined in Eugene Schwartz, *Overskill: The Decline of Technology in Modern Civilisation*, Quadrangle Books. Useful perspectives can also be found in E. Renshaw, *The End of Progress*, Duxbury; V. Ferkiss, *The Future of Technological Civilisation*, Braziller, and, of course, the works of Lewis Mumford. Specifically on fixes for pollution, see E. Goldsmith, 'Can We Control Pollution' *The Ecologist*, Nov & Dec 1979, no 8/9 and 10.
10. The lack of discrimination in *The Gaia Atlas* when discussing alternatives becomes clear, taking the example of energy, when comparison is made with the hard-headed thought by writers such as: F.E. Trainer, 'Limitations of Alternative Energy Sources' *Conservation and Recycling*, 1984, 7, (1) p.27-42; J. Holdren 'Environmental Aspects of Renewable Energy', *Ann. Rev. Energy*, 1980, 5, p.241-91; A. Lovins, in D. Meadows (Ed) *Alternatives to Growth*, or the relevant chapters of his *Energy Unbound* (Sierra Books); H. and E. Odum, *Energy Basis for Man and Nature*, McGraw Hill.
11. A. Lovins gives a checklist for appropriate energy in *Soft Energy Paths*. There are useful discussions in: A.R. Drengson, 'Towards a Philosophy of Appropriate Technology', *Humboldt Journal of Social Relations*, 1982, 9 (2) p.616-176; Langdon Winner, 'The Political Philosophy of Alternative Technology', *Technology in Society*, 1979, vol 1, p.75-86.
12. The inability of *The Gaia Atlas* to ever say 'No' to whatever people want and its Micawberist faith that something will turn up (sample the bit by Toffler) is well analysed by Garrett Hardin in his article 'Ecology and the Death of Providence', *Zygon*, 1980, 15, p.57-68.
13. See Kirkpatrick Sale, *Human Scale*, Secker and Warburg.
14. See Kohr, *The Breakdown of Nations*, David and Charles; and *The Overdeveloped Nations*, David and Charles. Interesting evidence for political fission not greater fusion is provided in Jane Jacobs, *The Question of Separatism*, Junction Books.
15. See: Kirkpatrick Sale 'Mother of All: An Introduction to Bioregionalism' in *The Schumacher Lectures Vol II*, Abacus. *The Ecologist* has published relevant articles by Peter Berg, Raymond Dasmann and Sam Love. The importance of a sense of 'place' is well conveyed in Wendell Berry, *The Unsettling of America: Culture & Agriculture*, Sierra Books.

A New Theology of Creation

TO CARE FOR THE EARTH: A CALL TO A NEW THEOLOGY, by Sean McDonagh, Geoffrey Chapman, London, 1986, £8.60.

One occasionally comes across a book which one feels should be distributed free around the world and Fr. McDonagh's very readable book is one of them.

Sean McDonagh is an Irish Columban missionary who has worked with tribal people in the Philippines for many years. There he has experienced at first hand the destruction of forests, the pollution and poisoning by pesticides, that underly many of the problems of social justice with which the Church is more usually concerned. Drawing on environmental problems from around the world, including his native Ireland, he presents hard evidence of the dangers threatening the Earth and questions why the Church has shown so little concern for what is in effect the blasphemy of the despoilation of God's creation.

He argues that since the Enlightenment period, Christians have lost their 'creation myth' to guide them in their relationship with the Earth. This loss coincided with the aggressive expansion of western industrialisation which has so destroyed the natural world. When a new 'scientific' story of creation emerged, there was no religious reflection on the significance of the new ideas, which could have guided western society into a different relationship with nature.

Based on evidence from geology and evolutionary studies, and the writings of Teilhard de Chardin, and

Thomas Berry, Fr. McDonagh synthesises a new creation story and draws out its implications for Christianity. He does this by looking at biblical tradition and examining how the Christian message has been lived out over the centuries in ways respectful of the natural world, including celtic mysticism, the rule of St Benedict, St Francis of Assisi and Hildegard of Bingen, the latter giving a very feminist approach to the Earth from nearly 900 years ago. These ideas have been largely submerged by the eschatological notion within the Church, of progress, or 'the glory to come'. Secularised versions of these millennial and redemptive myths underlie the destructive drives in both capitalism and Marxism, which may be deflected by redefining one's faith within a new theology of creation.

Such a theology can be enriched by the teachings and traditions of other faiths, and here Fr. McDonagh draws extensively on those of the tribal T'boli people of Cotabato among whom he works, as well as from North American Indian traditions, Buddhism and the Hindu faith. Surprisingly however, he makes no mention of Islam.

The final chapters place this enriched theology of creation within the context of liturgy and the sacraments, and presents some liturgies used among the T'boli people of the Philippines, as well as Christian moral living, spirituality and mission. Rather bravely for a Catholic priest he tackles the issue of population growth head-on and looks for more open attitudes to discussion on the part of the Hierarchy.

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In calling for a new appreciation of the sacredness of the Earth, Fr. McDonagh has given a lead to those who wish to re-examine their beliefs, whether religious or secular, in the light of the call which went out recently from Assisi, from the World Wildlife Fund Congress where leaders of all faiths were asked to preach the message of caring for God's creation.

While *To Care for the Earth* may not be the definitive work on ethics and conservation, it deserves to be the most widely read.

Richard Webb

Holistic Science

GOETHE'S SCIENTIFIC CONSCIOUSNESS by Henri Bortoft. Institute for Cultural Research, Tunbridge Wells, 1986. £4.50.

Goethe is still regarded by many as an isolated figure in the history of dissent from positivist science. However, the growing number of scientific studies consciously employing Goethe's scientific method—ranging from Schwenk's renowned study of water forms to Bockemül's most recent book on the dying forests of central Europe—is insuring Goethe's pre-eminence as the pioneer of a practicable holistic scientific method. Bortoft's timely book on *Goethe's Scientific Consciousness* sets out the principles upon which Goethe's method is based, supporting the Goethean viewpoint with reference to work that has been done (notably by Hanson) in contemporary philosophy of science, and to the writings of Husserl and Heidegger. Bortoft also gives considerable space to explaining Goethe's own monumental study of colour, as well as his seminal writings on plant and animal morphology, the latter being amplified by a discussion of Schad's Goetheanistic study of mammals.

At the heart of Bortoft's treatment of Goethe's scientific method is his assertion that the significance of positivist science lies less in the seemingly endless discovery of new facts, than in the *style of consciousness* by which the positivist scientist apprehends the world. It is a style of consciousness that has to some extent caught us all, making us into detached onlookers, and which, it could be added, lies at the root of the exploitative attitude towards nature in modern times. By the same token, Goethe's importance as a scientist lies not so much in any of the scientific discoveries he made, but rather in his *way of seeing* nature.

One feature of the "onlooker con-

sciousness" is the sense of standing back from sense impressions, in relation to which the mind-centred onlooker feels himself to be passive. The empirical scientist likewise assumes that sense-experience is something "given" which must then be interpreted according to some explanatory model arrived at by a separate process of reasoning. Such assumptions lie deeply imbedded in the modern psyche, and even though physicists may tell us that the time has come to revise these assumptions, they die hard. What Goethe pioneered two hundred years ago was a series of procedures by means of which the "onlooker consciousness" is overcome, and a deepened contact with the observed phenomena is made. This is achieved through generating an active and participatory mode of observation in which the observer plunges into the sensory experience of nature with full mental attentiveness. In such an "active seeing", the dualism between sensory observation and thinking is transcended: sense perception has a contemplative quality, and thinking has more the quality of perception.

Goethe's method is essentially phenomenological. It requires a renunciation of explanatory models in order to find the theory in the concrete phenomenon. The mind must be stilled, refraining from its habitual tendency to seek for explanations through a process of abstract thought. Likewise the Goethean scientist avoids the positivist technique of correlating observed qualities with measurable quantities—a practice which rests on the false presupposition that whatever is susceptible to exact measurement is in some way "prior" to the unmeasurable experience of qualities. By steeping himself in the total phenomenon, the Goethean scientist trusts that the theory or explanation will emerge as but a further dimension of the phenomenon itself—its inner identity or, as Bortoft puts it, its "depth dimension". It is this further—non-sensory—dimension which is the "whole" that welds the disparate aspects of a phenomenon into a unity. Ultimately Goethe's scientific method, through a combination of "sensory oversight and noetic insight" leads to an intuition of a realm of archetypes at once dynamic and flexible, through which things attain their characteristic form and structure.

Goethe's Scientific Consciousness is an admirably clear exposition of an epistemology and philosophy of science that challenges the very roots of the modern scientific habit of mind. Bortoft has a profound grasp not only of what Goethe him-

self was doing in his own wide-ranging scientific studies, but also of the significance of Goethean science today as a radical alternative to orthodox scientific thinking. This book cannot be too highly recommended to all who believe that the development of a new kind of consciousness of nature is required in order to counter the spiritually and environmentally destructive aspects of positivist science and its technology.

Jeremy Naydler

Green Swedes

THE ECOLOGISTS: FROM MERRY NATURALISTS TO SAVIOURS OF THE NATION by Thomas Soderqvist. Almqvist and Wiksell International, Stockholm, Sweden, 1986. 150 Kroner (approx £14.50).

Environmental politics arrived early in Sweden. By the mid-1970s, all the major political parties, from the Farmers' party on the right to the Communists on the left had endorsed the centrality of ecological concerns in the planning of national development; and by the late 1970s environmental issues had so come to dominate the political agenda that the Social Democrats suffered their first electoral defeat for half a century on the issue of nuclear power.

Swedish society became 'ecologized' over a twenty-year period. Whereas in the early 1950s, less than ten books a year were published on environmental subjects, by the 1970s the number had grown to 200. In the seven years to 1960, 12 bills directed towards environmental concerns were introduced, by 59 members, in the Swedish parliament; in the four years that followed, the number of bills quadrupled to 49, and the number of members sponsoring them increased similarly to 243. The translation of Rachel Carson's *Silent Spring* into Swedish in 1963 had a powerful impact, helping to launch a major national debate on pesticides.

The same period saw a parallel growth in scientific ecology. At the beginning of the 1950s Sweden could boast no more than a handful of ecological scientists, and reports on ecological research in scientific yearbooks commonly began with an explanation of what ecology was. By the mid-1970s, however, there were more than 500 scientists working full time on projects explicitly defined as ecological, and some 15 per cent of the budget of the *Naturvetenskapligas* (Natural

Science Research Council) was devoted to ecology.

Soderqvist's book examines the link between these two developments. It argues that the success of ecological scientists in building themselves a base in the academic and research institutions subsequently allowed them to 'enrol' politicians, journalists and other influential citizens into a 'lay' ecological movement. The growth in ecological science thus caused the increased public concern about the environment, rather than the other way round.

This is an interesting if unusual argument, and an accessible book on the subject would be a useful addition to the burgeoning literature on the European 'Greens'. Unfortunately this work, a doctorate thesis submitted to the University of Goteborg, is not particularly accessible. It focuses almost exclusively on the process by which the ecologists acquired their base in the universities and government research establishments. There are

detailed analyses of the relative successes of Swedish ecology's 'founding fathers' in recruiting research students, and of changes in the numbers of undergraduate and doctoral dissertations on ecological topics. The 'enrolment' of activists in the environmental movement receives much less attention. The book is also heavily larded with sociological terminology; for example, '... the process of ecologization as the emergence of a new naming practice can be accounted for in terms of the transition from a level of "practical consciousness" to a level of "discursive consciousness"'. For sociologists, this is no doubt a nice point; for the general reader it is a bit abstruse.

As a thorough history of the development of scientific ecology, this book cannot really be faulted. For an account of the rise of ecology as a political force, the non-academic reader should look elsewhere.

Jeremy Green

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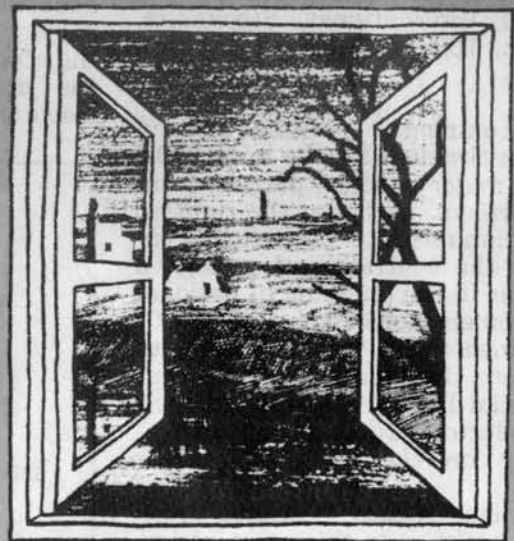
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Letters

Operation Flood: The Controversy Continues

Dear Sir,

Bharat Dogra ("India's White Revolution", *The Ecologist*, Vol.15, No.4) is an essay in misrepresentation of facts and mutilation of basic concepts underlying Operation Flood (OF).

The basic malady of Indian dairying arises out of an imbalance between seasonal supply of milk and unchanged year-round urban demand. The underlying hypothesis is that the above situation is demand-led and could be arrested if the organised sector (the public and co-ops) is enabled to render leadership in terms of quantity and quality. The EEC commodity-aid helped, in the early years of the programme "to prime-the-pump", to help the organised sector to emerge as a market-leader so as to contain the private-trade (and all the malpractices one would normally associate with it). Evidences are in plenty to suggest that much of the enhanced milk supplies, thus achieved, has helped the households in the lowest quartile, many of whom would otherwise have been unable to buy milk at private vendor prices. In the cities where organised sector has emerged as the market leader (e.g. in Bombay and Delhi) 60 per cent or more of the total quantity bought by this group of households are supplied by the organised sector.¹ Unevidenced statements ("supplies for the well-to-do living in cities") by Dogra are distortions of reality.

It is also important to dispel any myth that might have been created in the uninformed mind of your readers by Dogra's interpretation of OF breeding policy and its social implications. No major replacement of the local herd is even contemplated but efforts are being made to genetically improve a part of the milch herd through cross-breeding and other scientific methods to help the country to produce an adequate quantity of milk in the years to come. It is estimated, for example, that, given the state of the country's land use, feed resources and quality of milch animals, about 10 per cent of the animals could be gainfully converted into crossbreds which are efficient converters of feed and scarce concentrates, and thus there is no serious diversion of crop-land or use of exotic feeding practices intended.²

Who keeps such crossbred animals in Indian villages? There is a plethora of field studies which indicate rearing of crossbreds is equally popular among the people with less resources.^{3,4} They feed

these animals with traditional feeds available within the village, further enriched with the addition of balanced cattlefeed manufactured at the feed plant set up under Operation Flood. Balanced cattlefeed is sold at 30-40 per cent of the price of conventional feeds available in the market and yet has much higher digestible protein.

Field studies conducted in the milk-sheds of OF run contrary to Dogra's hasty generalisation regarding productivity across various producer groups (animals of the worse-off producers produce less than that of the "better fed animals of the better-off peasants") and also that of pattern of distribution of total milch animals among various groups. At least in the milksheds of OF, the distribution of animals and their productivity is much better than that of land: the landless and small farmers, having up to 4.99 acres, account for 78 per cent of total households, 22 per cent of total operational land and yet 53 per cent of the in-milk animals which account for 51 per cent of total milk production.¹ It is only logical to presume that, given the above distribution, OF would mainly benefit the poorer section of the rural households. This has been vindicated by a recent study at the Administrative Staff College of India⁵ which showed the positive impact of dairy development programme on different groups of families in dairy and non-dairy villages with respect to income, productivity and general food-intake, including milk. It was observed that the major impact of dairy development programme was stabilisation of income and productivity in the lean season and should comfort Dogra.

Poor state of organisation of agricultural data is rather universal to all developing countries, India being no exception. It is only in recent years that the Ministry of Agriculture has made conscious effort to estimate annual milk production. Also there is usually considerable lag between data collection and reporting. However, as modern inputs are introduced, milk production is only likely to increase, as evidenced by a comparative study of co-op and control villages in different locations of OF.⁶

Yours faithfully,
Parimal C. Bardhan
Deputy Director (MEU)
National Dairy Development Board,
Anand, India

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2. For an in-depth analysis of the feed/fodder vis-a-vis Indian milch herd: "Impact of increased dairy productivity etc", Tushaar Shah *et al*, *Economic & Political Weekly*, Vol.15, August, 1980.
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4. "Changing face of dairying in India etc" B.K. Ganguly, *Journal of Rural Development*, January, 1985.
5. "Impact of Dairy Development Programmes", B. Bowonder *et al* Administrative Staff College of India, Hyderabad, India.
6. "Impact of Operation Flood I etc", Katar Singh and V. Kukunda Das, Institute of Rural Management, Anand, India.

Operation Flood 2

Dear Sir,

Those unaccustomed to the manner in which staff members of the National Dairy Development Board (NDDB) India, respond to any criticism of its pet project, Operation Flood (OF), may be impressed by the seemingly authoritative, detached, paternalistic style in which Parimal Bardhan, a Deputy Director, has reacted to Bharat Dogra's article. It is therefore important to brief *The Ecologist's* readers on the nature of the data used by such NDDB authorities to underwrite their claims of what they consider to be a successful project.

Bardhan's reaction rests on six references. The first study he refers to originates from the NDDB itself. The second and sixth from the Institute of Rural Management, Anand (IRMA), a sister organisation of the NDDB and headed by NDDB chairman, Verghese Kurien, Bardhan's boss. Reference three is from an industry handbook, brought out by the same clutch of individuals. It is appalling that after fifteen years of the project, the NDDB is unable to quote an independent study in support of its claims, and must continue to rely on its own staff's biased output, and material from advertising agencies. Obviously the first casualty in such a situation is credibility.

References five and six refer to studies that make such elementary errors in method in compiling their data, that one relies on their conclusions at one's own risk. (See Shanti George's critique of these studies in *Economic and Political Weekly*, "Faulty Lactometers", May 31 and June 7, 1986.)

The NDDB itself has been pointedly accused in public, in print, of wilful misrepresentation of facts. It has routinely invented and concocted data, engaged in fraud, constructed graphs on the basis of non-existent statistics. In fact, in 1983, the organisation was caught filing a false affidavit in the Bombay High Court in which it had declared that it had nothing to do with the Government of India, despite the fact that all its Annual Reports begin with the statement that the NDDB was initiated by the Ministry of Agriculture, Government of India, in 1965. So this is the kind of organisation we are dealing with: it is paranoid about criticism and hysterical with critics. Only to be expected then that Bardhan should accuse Dogra of "mutilation of basic concepts underlying Operation Flood."

Note that this charge against Dogra comes from an organisation that has turned the original objectives of OF upside down. It began OF with the promise of enhanced milk consumption for all, but now argues that milk should be reserved only for the rich. Its wholesale reliance on imported western technology, completely inappropriate for India's ecological endowment, has turned milk, a commodity extremely valued among the population, and much more widely consumed before the project began, into an affluent item, an anti-social food. Its strategy for enhancing milk production cannot but enhance ecological disruption. (For a more elaborate substantiation of these fundamental criticisms, read, Shanti George, *Operation Flood: An Appraisal of Current Indian Dairy Policy*, Oxford University Press, 1985.)

I will ignore the bull about the imbal-

ances between supply and demand in Bardhan's letter: the theory changes from year to year, critic to critic. Bardhan observes that Dogra's statement ("supplies for the well-to-do living in cities") are "distortions of reality", since 60 per cent of the total quantity of milk purchased by the lowest quartile is now supplied by the organised sector. Such a claim is repeated by other OF propagandists. For instance, the World Food Programme (WFP)/FAO team observed in 1981: "The rapid expansion of supplies under OF led to a remarkable increase in milk consumption in general." The Jha Committee, set up by the Government of India in response to my investigative article on the project, also stated: "Much of the liquid milk is consumed by people with low incomes who cannot afford to pay a good price for it."

Now one would presume that such conclusions are substantiated by relevant data. There is data, and it is quoted: unfortunately, the data used in these evaluations indicates the opposite of what is claimed! For instance, the WFP/FAO Report stated, that between the early 1970s and 1980, in three of the four metropolitan cities that OF concentrated its supply on, per capita consumption of milk in millilitres per day fell from 235 to 229 in Bombay, from 267 to 257 in Delhi and from 153 to 121 in Madras." In fact, the WFP/FAO team went further, and approved of the project authorities' decision to stop making any special effort to get milk to the poor, despite this being put in as one of the conditions of the project. The Jha Committee implicitly accepted Dogra's charge when it stated that "the attempt to supply milk to urban consumers at particularly low prices offends against the principle of social justice because it imposes an unfair burden on the rural poor (producer) for the benefit of the urban rich." A World Bank Mission (1978) also admitted the project had benefited the urban rich. It noted that "the low income households bought relatively more milk from the private trade . . . no specific measures to stimulate consumption by lower income and vulnerable consumers were financed from funds generated, and added that "the bulk of milk and milk product supplies is still consumed by the more well-to-do people." The WFP/FAO Report concluded lamely: "For some time to come, milk and milk products will probably continue to be consumed by the more well-to-do."

In the matter of cross-breeding, Bardhan claims "there is no serious diversion of crop-land or use of exotic feeding practices intended." This is a lie. Farmers are being encouraged to grow green fodder on crop land, while the NDDB itself has actively encouraged farmers across the state of Madhya Pradesh to switch from the growing of tur (a pulse in traditional diets) to soya, which is then processed in completely automated plants, and exported as cattlefeed to European agribusiness firms. The NDDB has opened a modern slaughter house in Goa with OF funds to eliminate indigenous cattle, and engages in periodic efforts to import large numbers of milch stock from Europe or America. The trend is clear. The NDDB does precious little for indigenous pure breeds of cattle, and cares less for draft animals for agriculture. This is because it is merely a middle man for western dairy science, which is totally inappropriate for a country like India where the business of milk production is subsidiary to

the demands of agriculture. The ten per cent of Indian milch stock it seeks to "improve" through cross-breeding will attract scarce concentrates more equitably distributed among local cattle today, and encourage further degradation of such stock.

The data on the ownership of cattle is fake, without a shred of evidence to support it, and so is the data on productivity. It keeps changing from time to time. The Jha Committee, for instance, recently publicised a new set of statistics on this subject. It observed: "The majority of the rural producers whether in Anand or elsewhere comprise very small farmers or landless labourers as is evidenced by the fact that the milch animals owned by 3.1 million members of the cooperatives under OF, number some 6.5 million giving an average per capita ownership of 2." If these figures and those of Bardhan are put together, it would imply "logically" that landless labourers in India own two head of cattle each, a fantastic bit of nonsense.

Bardhan makes confident conclusions, despite the fact that, as he himself readily admits, the organisation of agricultural data is in a poor state in Third World countries. The point I wish to make is how come the conclusions are the reverse of what the data indicate? This is after all politically inspired social science research, where conclusions are all important, conclusions are what people read, and what legitimise Government policy. After all, social scientists and economists like Jha are Government owned scientists and are paid to manufacture data for the party in power. But hang on!

What have the FAO, the World Bank, the WFP, European dairy experts to do with Third World social science and its political mission? Why have they collaborated in this wilful manipulation of data and conclusion against the interests of the Indian population, against India's ecological endowment? Why do they refuse to admit they have simply been taken for a ride by India's ruling elite, represented this time by Amul, one of India's top thirty companies, and one of the largest agribusiness cooperatives in the world and the mastermind of OF? Because of the stakes involved. Before OF, the EEC had marginal openings into the Indian market. After the project began, India and now the Third World, have entered readily and easily into a paralysing dependence on the EEC dairy industry. Business has never minded a little shame.

Yours faithfully,
Claude Alvares
Parra 403 510 Goa
India

Sources:

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Jha et al: Report of the Evaluation Committee on OF II. Ministry of Agriculture, Government of India. 1984.

World Bank: "India: National Dairy Project Staff Appraisal Report", South Asia Projects Department, Agricultural Development Division, 1978.

Bharat Dogra Replies

Dear Sir,

Mr Parimal D. Bardhan refers to the helpful role of the EEC commodity aid "in the early years of the programme", as if the 'aid' was confined to just a much needed initial push and was phased out later. In fact my calculations for the first phase of Operation Flood Project (OF I) have revealed that there was a 57 per cent rise in milk product imports in the course of implementing OF.¹ At the same time the share of imported milk products in the total milk supply to Delhi more than doubled—from around 8 per cent before OF I to over 19 per cent in 1978-79.² If it is still claimed that OF was meant to benefit Indian farmers and actually did so, then this was the first time in world history that the means employed to help farmers was to snatch their market from them.

Both as a part of OF and outside OF, dependence on cross-breeding technology has remained the most emphasised method of increasing milk production of government policy in India in recent years.³ A widely quoted review of overall OF strategy for increasing milk production, of which stress on cross-breeding is only a part, by two prominent authorities on Indian dairying has concluded, "The OF II strategy (which in this context is the same as the OF I strategy) aims precisely at helping some farmers, by setting up feed plants and by arranging a supply of concentrates on credit, to produce more milk and earn more profit at the expense of other farmers not in OF districts. This pattern of exploitation of the many by the few has already been going on for generations in order to supply our city markets. City cattle and buffalo owners have long monopolised limited concentrate supplies—OF II strategy actually calls for an extension of this system of waste and exploitation by fostering city type milk production in selected milkshed areas."⁴

As for the claims of the rural poor receiving benefits from OF, statistics of the All India Rural Debt and Investment Survey (1971-72) tell us that the bottom 10 per cent of rural households (classified according to the value of assets) own only 1 per cent of milch animals, the bottom 20 per cent own only 5 per cent and the bottom 30 per cent only 12 per cent. And as has been pointed out in a recent widely discussed paper, "The fact that the relatively weaker sections do not have the resources necessary to maintain high quality milch animals makes it all the more likely that dairying development programmes based on cross-breeding, milk-marketing, processing and distribution would hardly benefit them; instead the benefits would mostly accrue to the better off segments."⁵

Some problems with respect to data collection that Bardhan points out are understandable, but what about the clear-cut cases of cheating by officials in presenting data to suit their claims?⁶ And can he also be ignorant of the fact that OF's claims of significantly increasing milk production have been disputed by eminent authors in leading journals?⁷

And lastly, to give Ecologist readers a glimpse of the kind of arguments OF authorities have been using in India to justify their work, this is what Dr V. Kurien, India's top dairy technocrat and

a kind of father figure to OF enthusiasts, said when he was questioned by a journalist regarding non-fulfilment of the objectives that OF had set itself "I felt justified in setting myself targets that were almost impossible to achieve. I think there is no harm in aiming at the stars. That is one way of reaching the tree-tops."⁸

Yours faithfully,
Bharat Dogra
New Delhi, India

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1. Milk Imperialism, *Social Change*, Paper 6.
2. *Ibid.*
3. For instance see draft Seventh Plan, Planning Commission p.30.
4. *Economic and Political Weekly*, Review of OF by K. Narayanan Nair and M.G. Jackson.
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8. Interview given to *New Delhi* magazine.

The Fluoride Scandal

Dear Sirs,

As Chairman of the National Anti-Fluoridation Campaign it is my privilege to thank you most sincerely for the magnificent support of the case against public water fluoridation published in the November/December 1986 issue of *The Ecologist*. Your editorial and four feature articles on this case provide a public service of considerable value.

What few people seem to realise is that the fluoridation issue is unique in that never before has taxpayers' money been used in Britain for making legal and promoting the spread of pollution in a way that puts the health and well-being of everyone at needless and avoidable risk. What everyone *should* know is that the US Department of Agriculture has said that "airborne fluorides" which sooner or later fall to earth and get into water supplies "have caused more world-wide damage to domestic animals than any other air pollutant" and that "man is much more sensitive than domestic animals to Fluoride intoxication."

Indeed it is probable that some of the ailments of old age, the causes of which doctors say they do not know and which they attribute to the passing of time—as though the passing of time of itself can cause disease of any kind!—is due to an accumulation over decades of fluorides in the human body. This hypothesis was put forward in the Spring 1984 issue of *Homeopathy Today* in an editorial. So far as I am aware it has never been questioned or disputed.

Another outstanding feature about the fluoridation issue is that to which Peter Bunyard drew attention in the first paragraph of the editorial on page 228 of your issue—namely, that more than 400 MPs out of the total of 650 did not vote on the 1985 Water (Fluoridation) Bill, the purpose of which was to make fluoridation legal some 30 years after its implementation had been started in Britain! As many MPs have agreed, MPs have a duty to oppose fluoridation in their protection of people's *right* to choose, when alternatives are available, what they and their children will and will not consume and what bodily treatment they will and will not have, in normal, everyday, non-emergency conditions. This being so, it follows that those 400-plus MPs who abstained from voting on the Bill and those who voted in its favour—a total of more than 500—were in dereliction of a duty they were elected and are being paid to discharge. This is a political scandal of considerable magnitude.

In promoting fluoridation its advocates often claim that all water is "naturally fluoridated"—that "fluoride is a natural constituent of water" and that "fluoridation is simply a slight adjustment of the fluoride content of water". The truth is that most—possibly all—surface water to which it is proposed to add fluoride at the waterworks has been polluted by fluoride before it reaches the waterworks and that fluoridation means increasing this pollution by anything up to 100 times, and even more in some cases.

In the hope of getting an official statement about this to pass on to our members, I wrote to the Department of the Environment early in July last year. Having received no reply I wrote again at the end of August, sending my letter by recorded delivery. Some two weeks later I received a reply saying that my original letter had not been received. The information I was then given in reply to my original letter, a copy of which I had sent with my second letter, struck me as more suitable for inclusion in Grimm's Fairy Tales than for sending to our members—that it was little other than a manufactured evasion of truth.

I wrote to the department again asking for specific information. Once again there was no reply. I sent another recorded delivery letter on November 11. I am still awaiting a reply. Presumably the department does not want to get deeper into the mire created by its own deception, so it is not committing itself to anything. And what now makes the matter more serious is that no MP seems to be willing to handle this politically hot potato, which makes one wonder just what lies behind it all.

If any of your readers want to know what they can do to combat fluoridation, we will be glad to send them information on receipt of 10p in stamps to cover the cost of literature, *plus* a stamped, addressed envelope—9 by 4 inches or larger—marked *ECOLOGIST* in the top left hand corner.

Yours faithfully,
P. Clavell Blount
Chairman—National Anti-Fluoridation Campaign
36 Station Road, Thames Ditton,
Surrey, KT7 0NS.

Cancer Risk and the Square Root Law

Dear Sir,

I do not understand Dr Alice Stewart's criticism (*Ecologist*, Vol.16, No.6, p.278).

(1) I was comparing like with like, assuming an excess dose spread over a working lifetime in the nuclear industry, or over the lifetime of a member of a critical group of the public (i.e. at about three times the present permissible limit for long periods, but well below the natural excess over our average natural background in parts of Cornwall and elsewhere). These 15 rems, added to 10 rems of natural background spread over a similar period, would have given the lifetime dose of 25 rem at less than 2 millirems a day, the effect of which I calculated.

Is this not exactly the case to which the square root law was supposed to apply? In Fig. 2 of the same article the law certainly does not apply to the observed effects of the large doses received from the bombs on Japan or from medical therapy.

(2) It is exceedingly difficult to see how a square root law could arise. At the cellular level where cancers are initiated, *all* doses of ionizing radiation will be received as a repetition of rare but quite large local doses. About half of our natural background and most of the radiation from bomb tests and the nuclear industry appears at the cellular level in the form of fast-moving electrons, produced either by a beta decay from a radioactive atomic nucleus already in the body or knocked out of an atom by a gamma ray.

Someone receiving a beta + gamma dose of one rem to the whole body will necessarily receive an average beta + gamma dose of 1 rem to every part of the body, including the cell nucleus. A single fast electron passing through a cell nucleus will deliver a dose of around half a rem, so that in the years it will take to receive 1 rem of beta + gamma dose from any source, only two fast electrons will have passed through the average cell nucleus. It does not seem possible that, for example, the first ten millirems to the whole body—corresponding to an electron passage through one cell nucleus in 50, leaving nearly all nuclei completely unaffected—can lead to a cancer risk half as great as the first 40 millirem in which 4 cell nuclei in 50 are similarly struck. This would mean that the first one in fifty cell nuclei struck lead to as much risk of cancer to their owner as the next three in fifty.

Surely at this level the probability that a cancer will be initiated must be proportional to the number of cell nuclei struck, leading to a proportional increase of cancer risk with dose. But the constant of proportion at low levels is likely to be several times less than that calculated from the Japanese nuclear bomb results, as the infrequency of electron strikes leaves time for repair.

Yours Faithfully,
J.H. Fremlin,
Emeritus Professor,
Birmingham, U.K.

Dear Sir,

Dr Fremlin is making an absurd assumption by supposing that the half power law extends down to 10 millirem. As he says, at such very low levels, the law must ultimately be linear. However, at Hanford, we were considering an average cumulative dose of around 2.0 rem with a maximum of 50 rem.

In our cohort analysis of these data, we assumed a power law (with an exponent as parameter) as a simple test of concavity or convexity of the actual law. In Figure 2 of the relevant paper are plotted the best fitting laws for several exponents. It may be seen that all curves agree at around 20 rem and the two hyper-linear curves agree at 5 rems. Furthermore, this is the dose at which the hyper-linear curves show the maximum disagreement with the linear model.

Now taking an average employment at Hanford of around 10 years, 5 rem corresponds to 0.5 rem/year and 20m rem to 2.0 rem/year. Now 2.0 rem/year is sufficiently greater than a background gamma dose of about 0.1 rem/year to suppose that all natural defences against radiation and cancer (e.g. DNA repair and the immune system) are probably operating at full strength, whereas they might not be doing so at 0.5 rem/year.

Yours faithfully,
Dr Alice Stewart
Queen Elizabeth Medical Centre,
Birmingham, U.K.

Pollution from the Pack?

Dear Sirs,

Irradiation of food is an emotive subject. As long ago as 1967, government legislation prohibited food for sale which had been treated with ionising radiations. Yet the process would appear to have practical benefits in food technology: low doses up to 0.15 kGy prolong the storage life of potatoes by checking formation of shoots, whereas higher doses up to 7kGy will destroy pathogens such as *Salmonellae* in poultry carcasses. As there are people around who undercook chicken—notably in fast fry take-aways—a public health benefit could be argued, as up to 32 per cent of fresh and 36 per cent of frozen carcasses may be contaminated by this organism.

However the food industry sees the most profitable application in irradiation of pre-packed fresh foods such as meat, fish and soft fruits. Using doses up to 3kGy destroys spores of spoilage moulds and bacteria on these foods, thus prolonging their shelf lives.

And here-in lies the problem: food for irradiation must be pre-sealed in packs to prevent microbial contamination after treatment. Now evidence is coming to light showing that irradiation causes

chemical changes in common packaging materials, resulting in the formation of new compounds which tend to permeate into the food. In some cases these taint the food, producing less than pleasant flavours. These effects do not take place in controlled experiments using identical non-irradiated food samples.

Little work has so far been done to screen packaging materials which might be used in food irradiation and to assess the toxicological hazards of chemical contaminants migrating into food following treatment. A team at Sheffield Polytechnic has been examining migration of organotin stabilisers in PVC packaging. It is such groups of compounds, which do not occur in natural bio-geochemical cycles, that could constitute a long term health risk to individuals consuming significant amounts of irradiated foods.

If packaging materials can be found which do not produce migratory toxic molecules upon irradiation, the advantages of such food technology might just outweigh its problems. When the health conscious consumer is increasingly prepared to pay a premium for really fresh food, is irradiation really necessary anyway?

Yours faithfully,
John Sears,
Egremont, Cumbria

Classified Ads

SITUATION VACANT

WE ARE LOOKING for a BIOLOGIST with experience in wildlife for a project for the conservation of the KALAHARI ECOSYSTEM IN BOTSWANA. Our firm has been selected for the tender presented by the government of Botswana and financed by the Commission of the European Community. We are looking for an expert with the following requirements: between 30 and 40 years of age, experience in the field in Africa, a very good scientific background, willing to live in the bush. We would like to receive the CVs in English, and if possible in French, with a list of any eventual publications. Bonifica, Consulting Engineers, Rue de la Loi, 34, BTE 6, 1040 Bruxelles, Belgium. Tel. 02 230 3135.

MISCELLANEOUS

Just started: CAMBRIDGE THIRD WORLD CENTRE. Attention will be mainly devoted towards working in schools and running a resource centre. If you can help with funds or material we would like to hear from you. Contact Joe Saxton, Co-ordinator, 17-20 Burleigh St, Cambridge CB1 10G, UK. Tel. 0223 358116.

PEOPLE CHANNELLING SUNLIGHT live in perfect ecological balance and thrive. Curious? Send SASE to Waters, POB 706-EC, Trinidad CA 95570, USA.

INTELLIGENT INTRODUCTIONS help educated people find partners. Telephone 0772-35469 (anytime).

NATIONAL GREEN PARTY NEWS-LETTER 6x yr. \$25.00 cheques payable to Green Party PO 127, Downers Grove, IL 60515 USA. Tel. 312-303-5996.

BRICKLAYER available, loves country-side/garden work. Repairs, pointing, new work. Board and transport only for good courses, otherwise cheap rates according to situation. Contact: Arthen, 21 Rugmere, Ferdinand St, London NW1. Tel: 01-485 7319.

HOLIDAYS and COURSES

MOUNTAIN HOLIDAY RETREAT: peaceful surroundings, fine walks, wild herbs, spring water. 3 bedrooms, kitchen etc. Write: Marcel A. Kuebli, Scheidbach, 3781 Turbach, Switzerland.

BRAZIL

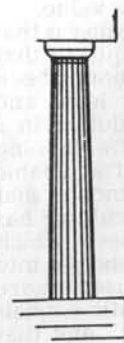
Fabulous really economical holidays throughout Brazil. Summer and Xmas. Interpreter accompanies. Details: (0525) 714780 evenings or Sundays or write W. Dixon, 32, Falcon Crescent, Flitwick, Beds. MK45 1LZ.

PORT CHARLOTTE, ISLE OF ISLAY, ARGYLL. Comfortable house to rent—sleeps up to 8 people. £120-£140 per week. Sara Parkin, 51 rue Longefer, 69008 Lyon, France. Tel. 01033 78 092225.

WEEKEND COURSES IN SOLAR COLLECTORS, WINDPOWER, ORGANIC GARDENING and much more. For details send SAE to Lesley Bradnam, Centre for Alternative Technology, Machynlleth, Powys. Tel 0654 2400.

SPAIN. COSTA DEL SOL. Villa near Marbella in one-acre garden, pool, orchard, vegetable patch. Sleeps 8-10. Write Marbella Villa, P.O. Box 110, Gibraltar, or call 010 3452/770796 (ansafone).

TRY A BUDDHIST RETREAT. You've heard of the benefits of meditation? Try it for yourself in ideal circumstances. A retreat can give you fresh insight into your life. You will enjoy the harmony of practising a Buddhist lifestyle for a few days in the company of like-minded people. Write or telephone for details of our Spring Retreat (10-17 April) or our programme of events. Most of our events are for men but we can also give you details of women's/mixed retreats. Details from—The Retreat Organiser, Padmaloka Buddhist Centre, Lesingham House, Surlingham, Norwich NR14 7AL. Tel 050 88 8112.



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Classified Ads Contd.

THE ECOLOGIST CONFERENCE ON GAIA

OCTOBER 21 - 24, 1987

This conference aims to look at the living processes involved in the regulation of the Earth's environment. What has the effect of this process been on evolution? How has the concept of Gaia affected man's thinking? Are Gaia and industrial man incompatible?

Speakers will include: Professor Jim Lovelock, Atmospheric Chemist and Author of *Gaia A New Look at Life on Earth*; Professor Lynn Margulis, Biologist and Author of *Microcosmos*; Dr Andrew Watson, Marine Biology Association, Plymouth and collaborator with Professor Lovelock; Dr Martin von Hildebrand, Anthropologist and Specialist in the Cosmology of tribal Indians from the Colombian Amazon; Dr Warwick Fox, Deep Ecology and Gaia; Dr David Abrams, Psychology of Gaia; Edward Goldsmith, Editor of *The Ecologist*, The Impact of modern man on Gaia.

The conference is sponsored by the Wadebridge Ecological Centre and will be held at Worthyvale Manor Conference Centre, Camelford. The conference organiser is Peter Bunyard.

For further details and application form contact: The Conference Secretary, Worthyvale Manor, Camelford, Cornwall, U.K., PL32 9TT (Tel. 0840-212711).

DIARY DATES

INDUSTRIAL AND BIOMEDICAL MICRO 87. International Conference and exhibition of microscopes and optical equipment for those involved in the field of Biomedicine will take place at the London West Hotel, Lillie Road, London SW6 from 7-9 July 1987. For further information about the MICRO 87 contact Dawn Hague, The Royal Microscopical Society, 37/38 St Clements, Oxford, OX4 1AJ, U.K.

The Institute for Environmental Studies, Free University in Amsterdam, Netherlands, will hold a symposium on the theme **ENVIRONMENT AND DEVELOPMENT, THE YEAR 2000 AND BEYOND.** The symposium will be held on May 12, 1987 at the occasion of the publication of the report of the World Commission on Environment and Development. For further information tel. 020-5483827, Amsterdam, Netherlands.

SEVENTH INTERNATIONAL TEILHARD CONFERENCE: Ethic, Ecology and Teilhard de Chardin. April 3-5, 1987 at St Mary's School, Wantage, Oxon. Information from Barbara Tweedy, Conference Secretary, The Croft, Portway, Wantage, Oxon, OX12 9BU. Tel. 02357 2196.

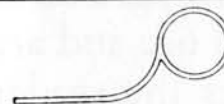
ONLY ONE EARTH. Conference on sustainable Development organised by the International Institute for Environment and Development Regent's College, Regent's Park, London NW1, England, on April 28, 29 and 30, 1987. The conference is a contribution to the European Community's European Year of the Environment, 1987. Details and Booking Form from Conference Office, IIED, 3 Endsleigh Street, London WC1H 0DD.

ENVIRONMENT 87—International Symposium on Environmental Management organised by the General Directorate of Environment of the Prime Ministry of Turkey and Bogazici University Faculty of Engineering Pollution Control Research Group at Istanbul, Turkey between July 5-9, 1987. Further details from Gunay Kocaso, Bogazici University, PK2 Bebek, Istanbul, Turkey.

KNOWING YOUR PLACE is an exhibition of creative and personal maps produced by 18 leading artists commissioned by the conservation and arts charity **COMMON GROUND** as part of its **PARISH MAPS PROJECT.** The exhibition is at the London Ecology Centre, Covent Garden from March 17th to April 25th, and afterwards tours to venues throughout the country. (Further details from Tom Greeves, Common Ground, 45 Shelton Street, London, WC2H 9HJ.)

LOW LEVEL RADIATION. Third Standing Conference organised by BOND—Britain opposed to Nuclear Dumping—on the Dangers of Low Level Radiation to be held on April 11 and 12 at Grantham Leisure Centre. Conference Fee £12. Details from Dr Robin Marrow, Fulbeck House, Nr Grantham, Lincs or Mrs R. Jones, 4 Lime Tree Villas, Tween Dykes Road, Sutton-on-Hull, HU7 4XD. Tel. 0482 711871.

NUCLEAR OR NON-NUCLEAR FUTURES. April 28th-30th. The decision must be made soon. Which way is this country going? The major issues—Waste Management, Phasing Out, Costs and Benefits, Safety, Alternative Policies will be debated in a three day conference, and led by 30 expert speakers. They include: Jonathon Porritt, Tom Burke, Sir Hugh Rossi M.P., Michael Clark M.P., Mark Barrett, Alice Stewart, Daffyd Ellis Thomas M.P., James Robertson. For full information contact: The Centre for Energy Studies, South Bank Polytechnic, Borough Rd, London SE1. Tel: 01-928 8989 Ext 2596.



The Symbol

The sloping line symbolises the principle of **ECONOMIC GROWTH.** The circle in the end stands for the way out; the principle of **RECYCLING.**

This symbol is used on:

ECOSCRIPTS: a series of original publications, reprints and translations in the field of ecology and ecosophy. **ECOSCRIPTS:** aim at furthering mankind's ecological consciousness.

(Published by the Foundation for Ecological Development Alternatives) Netherlands **ECOSCRIPTS** are available from **THE ECOLOGIST**, Worthyvale Manor Farm, Camelford, Cornwall PL32 9TT, U.K. Tel: (0840) 212711. Write for price list of English language **ECOSCRIPTS.**

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